SOLICITATION NO. DACW59-03-B-0007

ACQUATIC ECOSYSTEM RESTORATION
NINE MILE RUN
PITTSBURGH, PENNSYLVANIA

AMENDMENT

NUMBER 3

The following changes are made to the Specifications and Drawings for Aquatic Ecosystem Restoration Project, Nine Mile Run, Pittsburgh, Pennsylvania:

Specifications

SF 1442, Block 13A. The bid opening date is changed from "14 August 2003" to 28 August 2003. The bid opening time remains unchanged.

Section 00010

Delete pages 00010-3 through 00010-8 and substitute the attached revised pages 00010-3 through 00010-8.

Section 00800 SPECIAL CONTRACT REQUIREMENTS

Page 00800-10, Paragraph 52.236-16 - Delete paragraph 52.236-16 QUANTITY SURVEYS (APR 1984) and substitute the following paragraph 52.236-16 QUANTITY SURVEYS (APR 1984) ALTERNATE I

52.236-16 QUANTITY SURVEYS (APR 1984) - ALTERNATE I (APR 1984)
(a) Quantity surveys shall be conducted, and the data derived from these surveys shall be used in computing the quantities of work performed and the actual construction completed and in place.
(b) The Contractor shall conduct the original and final surveys and surveys for any periods for which progress payments are requested. All these surveys shall be conducted under the direction of a representative of the Contracting Officer, unless the Contracting Officer waives this requirement in a specific instance. The Government shall make such computations as are necessary to determine the quantities of work performed or finally in place. The Contractor shall make the computations based on the surveys for any periods for which progress payments are requested.
(c) Promptly upon completing a survey, the Contractor shall furnish the originals of all field notes and all other records relating to the survey or to the layout of the work to the Contracting Officer, who shall use them as necessary to determine the amount of progress payments. The Contractor shall retain copies of all such material furnished to the Contracting Officer.

(End of clause)

Page 00800-14. Paragraph 52.777-4019. Increase the amount of the Comprehensive General Liability to $1,000,000 per occurrence for bodily injury, including death; $500,000 per person and $1,000,000 per occurrence for property damages.

Add the following verbiage to paragraph a.

"Said coverages to be occurrence-based, with the Commonwealth of Pennsylvania named as an additional insured."

Add the following after paragraph b.

c. "The Government Contractor will have during the entire period of performance under the contract awarded for the Restoration Project, Comprehensive General Liability, Property Damage, Automobile Liability and Workmen's Compensation and Employers Liability Insurance."

Section 01012 DESIGN AFTER AWARD

Delete the section and substitute the attached revised Section 01012.

Section 01050 SCOPE OF WORK

Delete the section and substitute the attached revised Section 01050

Section 01100 GENERAL REQUIREMENTS

Delete the section and substitute the attached revised Section 01100.

Section 01270 MEASUREMENT AND PAYMENT

Delete the section and substitute the attached revised Section 01270.

Breakdown of Planting Areas by Phase of Work

Delete the sheets for Planting Zones 1, 3, 4, 5, and 6 and substitute the attached revised sheets for Planting Zones 1, 3, 4, 5, and 6.

Attachment 6a Permits Phase (60% Final) Specifications

Section 201, Paragraph 201.3 – After subparagraph (c) insert the following:

(d) Limits of Clearing and Grubbing. In general, clearing shall be performed within the limits of grading indicated on the drawings.

Section DSP13-8, Paragraph 13-8.1 – In the first line, after "structures" insert for Phase 1B.

Section DSP13-24 – At the end of the section insert the attached sketch "ROOTWAD WITH LARGE WOODY DEBRIS DEFLECTOR and LARGE WOODY DEBRIS DEFLECTOR".

Attachment 15 – Insert the attached new Attachment 15 Future Ball Field Site for the City of Pittsburgh.

Attachment 16- Insert the attached new Attachment 16 Report of Survey.

PRE-BID CONFERENCE – QUESTIONS AND ANSWERS

Following are questions and answers resulting from the Pre-Bid Conference held on July 30, 2003 at the project site in Pittsburgh, PA and other questions that were submitted in writing to the Contracting Officer.

1. Clarify goals versus requirements of HUB Zone, WBE, MBE and Small business involvement?

Response: These are goals. We are asking for your best faith effort in reaching those goals. If you are a large business, you will need to submit a subcontracting plan according to Clause 52.777-4704 which will need to be approved before award.

2. As far as small business involvement…does it matter whether you are a prime or a sub or are you just looking at the dollars in the whole bundle that are assigned whether it be a prime or a sub.

Response: It is based upon the whole bid that is put in and not on bits and pieces of it.

Additional Clarification: Your small business goals are based on the total dollar you intend to subcontract.

3. Any chance in delaying the bid opening?

Response: Bid Opening has been delayed.

4. Employment goals for minorities, if you couple up with an engineering firm or a specialist do they apply, 6.9% apply to him also.

The percentages are based upon the whole bid. If the bid is a million dollars it's not as if half of it is theirs and half of it is yours, it's the whole bid.

Response: The percentages are based upon the total bid. 6.3% for minorities and 6.9% for female participation for each trade. The % is based on the contractor's total work force in each trade.

5. The moving of the materials on site, must they conform to the PA Safe Fill Act? I seen gas pipe with coating on the outside, coating quite possibly has asbestos in it. There were 3 or 4 pipes in the stream that were exposed. That black coating, in my experience all has asbestos in it. So that removal has asbestos abatement.

<u>Our response in the field was:</u> On the question of disposal, there is a disposal area, it is referred to in the specifications as the ball park. That is currently where the stone is stored now, that is the ball park area. It says that disposal of excess excavated material shall be at the ball field located across commercial avenue. Disposal shall be in accordance with the requirements of the Nine Mile Run Aquatic Ecosystem Restoration project Phase 1A joint permit application, PA water obstruction and erosion permit and the Corps of Engineers section 404 permit attachment 9. That's the area where the rock is currently being stored. That is the ball field. Technically that location is in Phase 2 but it is covered under this permit. <u>But is now…</u>

Additional Response: Contract specifications section 01050, paragraph 1.5.1 e. covers the disposal of this pipe. The pipe is be disposed of in a permitted solid waste disposal facility, which is permitted to accept the particular material.

6. The trees that have all been marked, that have the spray paint on them, when they were marked were they identified?

As I am walking through I see spray paint marks on trees and I believe they are in reference to trees that you have to put the safety orange fence around and I was curious to know if they were all identified within the contract. I have not had time to read through the entire contract. Like tree number 19, sycamore oak, do you know if it was stated as to what species it is?

*Response: **The trees to be protected are identified on the Grading, Erosion and Sediment Control plans as being surrounded by BOF. They may or may not be identified by marking in the field.***

7. The material that needs to be hauled away is there a municipal dump where the material can be hauled to or are their stated Army Corps places where you can take the debris to be removed and dumped? Like approved receivers of material?

Response: There are commercially available facilities where you can haul to in the area for most of the materials. So far as a Corps approved site, we don't approve sites. It is generally the state of Pennsylvania is the approving authority for different materials whether it is construction debris or those types of things.

Additional Response : Contract specifications section 01050, paragraph 1.5.1 d. covers the disposal of excess excavated material and paragraph 1.5.1 e. covers the disposal excess clearing debris.

8. I noticed that there are bid items for design as a lump sum, could you go a little bit more into what you see being the design component, because it's probably going to be a sub to the prime contractor. I look at the plans restoration wise and they're fairly complete and you're getting permits based upon what you have currently. What do you see the design component besides the six items or so listed for structural components. Do you need station offsets for all the treatments? Could you go into it a little bit more.

Response: The design components listed in the specifications and amendments are all that we require for this project. Section 01012 of the specifications has been amended to provide clarification to your question concerning the station offset.

9. Regarding the design component, is there any additional design analysis, like a HEC RAS analysis that will need to be completed by the designer?

Response: I don't believe so. At this time unless you have a proposed change to the alignment I can't imagine that we would need anything else. That information is in the permit package that has been supplied to you.

Additional Response: As stated in Section 01012, paragraph 1.6.1 b, hydraulic data for the existing design is provided in the Design Analysis Reports (Attachments 7a and 7b) and additional HEC-RAS output data will be furnished upon request for completion of design of the plunge pool, culverts and other features. Additional design analysis would only be needed for changes to the alignment or protection features that would produce different hydraulic characteristics.

10. Is there a particular design storm that this work needs to be guaranteed to . If you a have a 500 year event are you designing to 50 year or what is it that is the design basis?

Response: ***The current design features are based on bankfull limits. Information on the current design is provided in the 1B and 2 DARs, Sections 4.0, Analysis and Design Approach. Any additional design should be based on the same bankfull limits.***

11. You might have already answered this. Did you say that the prime contractor could fulfill some minority or small business requirements?

Response: You mean actually do the work instead of having small businesses perform the work. No, I didn't say that. I'm sorry if you misunderstood me. You have to have a plan whereby you are going to try to reach those goals that are set in the spec using small and small disadvantaged business to do some of the work.

Additional Clarification: If you are a large business, you will need to submit a subcontracting plan according to Clause 52.777-4704 which will need to be approved before award. If you are a small or small disadvantaged business bidding on this project, you are not required to submit a subcontracting plan.

12. If you are a WBE could you fulfill your WBE if you were the prime also could you do both those things?

Response: Yes.

13. How are you defining small business? Is it by the number of employees or by average revenue?

Response: It's average revenue. It is $28.5 million over a 3 year period. An average of 3 years.

14. Would you be weighing the bid results on the subcontractors ability to I mean the prime contractors ability to meet the goals of the contract like for minorities and for small business?

Response: You mean in order to determine who was going to get the bid. NO. It's going to be based upon low bid and submitting all of the required paperwork that is necessary to be evaluated.

15. You said that it would be low bid that would be the main selection criteria, assuming everybody is qualified. But there is a 10% incentive for HUB Zone, right? Participants, don't they get a discount on their numbers of 10%?

Response: If a HUB Zone company submits a bid on this project, there would be a 10% factor added to the other non-HubZone bids that are not listed in FAR 52.219-4004, page 00600-13 of

the solicitation . So it will still be awarded on the basis of the low bid, and submission of all of the required paperwork. You have to be responsible and responsive.

16. As far as the design goes. You are looking for a contractor to have a designer sign off and seal the plans. Am I correct?

Our response in the field was : Yes But is now…

Additional Response: The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

17. So the assumption is that we would have to be in agreement with all the principles and parameters used in these plans then and would have to build anything if we needed to go back and check things and possibly modify things we would have to build that into our lump sum price?

Our response in the field was : Yes But is now…

Additional Response: The contractor will not be required to sign off and seal any of the existing drawings.

18. Back to this HUB Zone consideration, I just want to be very clear so that I understand this. 10% of the HUB Zone contractors bid will be discounted and the way that you are going to express the discount is to take 10 % of his price and adding it to everyone else's bid for comparison reasons. Is that what you are saying?

Response: Everyone else's bid will have a 10% factor added to their bid to determine the low bid.

Additional Clarification: According to Clause 52.219-4004, page 00600-13, all bidders except those listed in the previous Clause will have a factor of 10% of their individual bid price added to their bid for evaluation.

19. If I can work an example. Let's say a HUB zone subcontractor does the Belgian block work and say that is $10,000 out of a $1 million job, how do you quantify that? Is it in those bid quantities? Do you indicate that you have $10,00 worth of HUB zone participation here and there's 10% of $10,000

thrown onto everyone else's bid because we can't have that sort of dominate the whole bid its only a tiny fraction?

Response: This is based upon the whole bid. We don't break it down. We are only looking at the prime bidder. Whoever is bidding on this as the prime bid. It would have to be A HUB Zone bidding on the whole job as a prime for this factor to be considered.

Additional Clarification: According to Clause 52.219-4004, page 00600-13, all bidders except those listed in the previous Clause will have a factor of 10% of their individual bid price added to their bid for evaluation.

20. I noticed in a number of the plans that were plotted out that are called grading and erosion sediment control plans don't feature erosion and sediment control features on them. Are you already applying for erosion and sediment control? Is that something that is just missing out of .PDF or what is the status of that?

Response: The permits for phase 1b have been obtained and are part of the bid package. The permits for phase 2 are being obtained by the City of Pittsburgh. The permits include the E&S plan. All E&S features such as Super Filter Fence (SFF), Standard Filter Fence (FF18), Rock Construction Entrance, Temporary Access Bridge, Moundable Earth Berm, etc. are shown on the Erosion and Sediment Control plan view and detail drawings that were provided in both attachments 6B and 10.

21. The remaining 40% that has to be done for the design build. The environmental issues are all dealt with in the 60% and there are no modifications required in the additional 40%? Any E&S permits, discharge permits?

Response: As I have mentioned earlier, that packages that were designed, were intended to be designed to a degree in which we could get permits from that. We were able to get them for phase 1b so not other measures will be needed and for phase 2 we are in the process of getting those permits and we don't feel that we would need anything else after that either.

22. HUB Zone. Let's say that we are a prime, we are not a HUB zone, and 50% of the work is being done by a sub that is a HUB zone do we get credit, at all, for HUB zone involvement, do we get any of that 10% advantage?

Response: No, it is only the prime itself. If the prime would be using a HUB Zone subcontractor, you would get credit for your subcontracting goals by using a HUB zone contractor, but it is not going to add any factors to your bid.

23. Given that for understandable reasons there is not yet an answer for the pertinent engineering questions that have been raised today, you told the gentleman earlier that asked for a bid extension, maybe not, if more than 50% or 60% of us wrote letters asking for a bid extension is that feasible?

Response: It will be taken under consideration. You must strong and convincing reasons for it. Answer why you need a postponement?

24. In to reinforce a delay for the bids, if it were awarded you probably wouldn't get notice to proceed until October. So that means any of your planting would probably not get done in the normal growing season and it is dictated that you don't proceed to the next step until you finish the step before. So you are missing a window of opportunity because we are already late this season as far as planting and getting materials that would grow.

Response: There is other work that can be done that doesn't include the planting. For instance there is some excavation work that can be done and there is a lot of live branch layering that has to be done during the winter months, during dormant periods that can be done. You are right, the planting can't be done. It has to be done during specific times but there are other features of work that could keep moving, weather permitting of course. You could be at the upper end of Nine Mile. The plunge pool and that area and work your way down. There is a lot of live branch layering, boulder banks and things like that.

25. Is there anything in the specs for deer-perdation or geese-perdation on some of the tasty treats that we are going to be planting out there for them?

Response: No. If this becomes excessive, it will be taken under consideration.

26. The topsoil that contains the exotic and invasive plants. Can that be disposed of at the same site that was mentioned earlier?

Response: Disposal of solid waste and excess clearing debris and the 6 inch topsoil removed from the invasive species management area shall be disposed of at a permitted solid waste disposal facility in accordance with federal, state and local requirements. A permitted solid waste disposal facility is a landfill or other facility that is properly permitted by the state. In other words PA. In which it is located or other facility that is properly permitted. The facility shall be permitted to accept the particular material being disposed. So that would have to be taken to a licensed land fill.

Additional Response: Contract specifications section 01050, paragraph 1.5.1 e. covers the disposal of the six inches of topsoil removed from the Invasive Species Management areas. This material is to be disposed at a permitted solid waste disposal facility in compliance with

Federal, State, and local requirements, and in accordance with Section 01355 ENVIRONMENTAL PROTECTION.

27. Elaborating on that question about the invasive plant effected soil, it is presumed that a certain footprint is loaded with invasive plants and that soil has to be hauled off, is that a bid quantity or does a judgment need to be made in the field on what constitutes invasive tainted soil?

Our response in the field was : That is a bid quantity and those areas would be marked in the field. That area would be identified and hauled off site. But is now…

Additional Response: The limits of the extensive invasive species soil removal are shown on Exhibit C at the end of the folio of drawings. The jurisdictional wetland boundaries will be marked (Attachment 6a, Section 686, para. 686.3 (d),and trees for hinged snags (Attachment 6a, Section 13-5, para. 13-5.2 (b)and 13-5.3(b)).

28. In the straw it is states that it has to be weed seed free but what is the , do you submit a submittal and say I am proposing to use straw from this source and the Corps checks it and approves it or are there already companies out there that have this product available that you all are aware of?

Response: Paragraph DSP13-29.2 3 states: "The Contractor must provide the Contracting Officer documentation from the supplier that the material is weed-free. Straw obtained from regular farming operations is not weed-free and will not be accepted by the Contracting Officer. ".

29. Qualification requirement number 3 (page 00010-7) reads as follows: "Provide a list of at least 2 stream realignment projects for the purposes of aquatic stream restoration and 2 projects which utilized bioengineered solutions within the past 10 years, on which your firm has been the prime construction contractor." Is it the intent of the USACE to disallow qualifications of team subcontractors that are on the prime contractor's team?

Response: The intent of the Corps is to obtain an experienced Prime Contractor able to make the tough decisions needed for a natural stream realignment project. For Joint Venture firms, both firms would be considered as the prime contractor and able to meet these requirements.

30. Qualification requirement number 4 (page 00010-7) reads as follows: "Provide a list of at least 2 projects with planting schedules requiring a minimum of 10 acres of plantings with a diversity of 50 plant species or more that you have completed within the past 10 years." Does this requirement refer to design projects, to construction projects or to both? Does this requirement apply only to the prime contractor, or can qualifications of team subcontractors be included?

Response: This requirement for this qualification is for construction only and can be completed by the prime contractor or a subcontractor.

31. Qualification requirement number 4 (page 00010-7) reads as follows: "Provide a list of at least 2 construction projects within the past 10 years in which non-tidal wetland and non-perennial riparian wetlands construction was required." Does this requirement refer to construction projects construction and over sighted by the prime, or can projects designed by the prime but constructed by others be included? Does this requirement apply only to the prime contractor, or can qualifications of a team of subcontractors be included?

Response: This requirement for this qualification is for construction only and can be completed by the prime contractor or a subcontractor.

32. Is it the intent of the USACE that the prime contractor stamp and sign the 65% design previously prepared by others?

Response: The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

33. Is it the intent of the USACE that the prime contractor stamp and sign only the additional design (i.e. as listed in Section 01014, page 5, paragraph 1.6.2) performed by the prime contractor?
Response: Yes. The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

34. Is it the intent of the USACE the Contractor be held responsible and liable for the Government furnished design elements?

Response: No. The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

35. Who is the designer of record for the Government furnished design elements?

Response: The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

36. Re. Section 01012, page 5 paragraph 1.6.2: Will design calculations be made available to the Contractor to support the selection of the culvert pipes for which the Contractor is to "complete the design"?

Response: ***Section 01012, paragraph states: "The Contractor shall provide additional details, per PDT Standards, for this culvert. In addition to standard construction details of the culvert, the Contractor shall determine if a headwall or wing walls are needed and furnish appropriate design details." The size and length of the culvert a****re*** **given so no design calculations are necessary for the pipes. The details to be provided would be standard PDT construction details and details of the headwall or wing walls.**

37. What is the extent of {enforceability] of the construction warranty? In specification Section 00800, the paragraph titled "Warranty of Construction Work (Aug 1997) [paragraph 52.000-DB06 (page 00800-60] states the following: "… Contractor shall remedy at Contractor's expense any damage when that damage is a result of –(1) The Contractor's failure to conform to contract requirements; or (2) Any defect of equipment, material or workmanship."

Response: The part of the paragraph quoted above relates to remedy of damage to Government-furnished or owned real or personal property caused by the Contractor's failure to conform to contract requirements or use/installation of defective equipment or materials.

38. What is the design liability of the Government-furnished design? Who is designer of record? In specification Section 00800, the paragraph title Warranty of Construction Work (Aug 1997)" [paragraph 52.000-DB06 (p. 00800-6)] states the following: "Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defects of material furnished by the Government nor for the repair of any damage that results from any defect in Government-furnished material or design."

Specification section 01012 paragraph titled "Design Requirements" [paragraph 1.6 (page 01012-4)] states the following: " …The design shall be developed by taking advantage of the existing bidding documents. It should be noted that any changes in the design that require modifying the existing Erosion and Sedimentation Control plans or Permits is not recommended and will be thoroughly reviewed by the Corps for necessity and impact to the project. All design changes shall be submitted to the Corps in the

form of construction submittals unless other wise noted." Specification Section 01012 paragraph titled "Government Furnished Data" paragraph 1.6.1 (page 01012-4)] states the following: " The Corps of Engineers will furnish the following items for the completion of design;…b. … Government has provided the hydraulic data for this project in the Design Analysis Reports for Phases 1B and 2… Additional HEC-RAS output data will be furnished to the Contractor… The hydraulics data provided shall be used to complete the current plunge pool design and culvert designs and to make other design changes."

Response: The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

The contractor will not be held responsible for the government furnished construction materials.

39. Re. Section 00800-6, paragraph 52.00-DB05: What constitutes a 'break' of the warranty for design purposes?

Response: If by "break" you mean an extension of time, the statutes do not account for an extension of time. If by "break" you mean a shortening of the warranty, the Government would not agree to a shortening of the warranty.

40. Re. Section 00800-6 paragraph 52.000-DB06: What constitutes a 'break of the warranty for construction purposes?

Response: There is no break in the warranty unless agreed to by both parties.

41. What is the duration of the design warranty? In specification section 00800, the paragraph titled "Warranty of Design (Firm-Fixed Price Design-Build Contract) (May 2002)" [paragraph 52.000-DB05)] states the following: "…effective through the Statue [sic] of Limitations and Statue of Repose, as applicable to the state that the project is located in."

Response: See 42 Pa. CSA 5525 and Pa. CSA 5536. Warranty time may be either 4 or 12 years based on type of defect.

42. What additional details of the existing condition of the abandoned bridge are required? In specification Section 01012, the paragraph titled "Survey Pins" [paragraph 1.6.2, Nine Mile Run 3. (page 01012-6) states the following: "The Contractor shall provide additional details of the existing condition…"

Response: Reference amended specification section 01012.

43. Re. Section 01012 (page 4) paragraph 1.6: Are existing erosion and sedimentation control plans signed and stamped? In the event that they are not, is it the intent of the USACE that the Contractor sign and stamp the erosion and sedimentation plans even though the specifications discourage making any changes to those plans?

Response: The E&S plans are signed and stamped.

43. What is the USACE definition of "planting season"?

Response: Paragraph DSP 13.29.3 1. states: "Planting shall be conducted between September 1 to December 1 and March 15 to June 15". Other "planting seasons for the Live Branch Layering, Live Stakes and Native Seeding and Mulching are given in paragraphs DSP13-30.1, DSP13-31.1 and DSP13-32.3 (a), respectively.

44. Does this project require the use of union labor?

Response: The contract does not require the contractor to use union labor; however, you are responsible for paying the applicable Davis Bacon Wage Rates attached to the solicitation.

45. Is it a conflict of interest for the firm that prepared the 65% design on which the procurement is based to participate in the proposed work along with any of its subsidiaries, affiliates or assigns?

Response: It is a conflict of interest for the firm that prepared the 65% design on which the procurement is based to participate in the proposed work along with any of its subsidiaries, affiliates or assigns in the capacity of a prime contractor, joint venture team or a subcontractor.

46. Specification Section 01050, the paragraph entitled "Government-Furnished Materials" states that the Government will furnish rock (i.e. R-8) and riprap (i.e. R-7 and R-5) for construction in Phase 1B. The same materials are required for Phase 2. Will the Government furnish these materials for Phase 2?

Response: The Government will only furnish rock for Phase 1b. The Contractor will be responsible for furnishing all rock for Phase 2 as specified in Attachment 6a, Section DSP 13-8, paragraph 13-8.2 (f).

47. On the Bid Form Item 0011 "Slope Erosion Protection" the quantity is 38,645 square yard (SY). Please verify the units of measure. It appears the unit of measure should be square feet.

Response: The quantity of Slope Erosion Protection has been corrected. See the changes that have been made to the Unit Price Schedule.

48. Bid Form Item 0019, Rock Vanes, is in units of cubic yard (CD) and covers the plan view and profile details on Drawing Number 66. The details include materials that may be measured on a cubic yard basis including vane rock, footer rock and gravel tailings. What material or combination of materials will constitute the basis of measurement? Similar questions arise for rock cross vanes, rock J vanes, step pools ,a and riffle structures.

Response: This amendment changes the units of measure for these items. Please refer to the unit price schedule for these changes. The items should be bid so that the unit price for each feature contains all costs to build each structure. The cost should include items such as excavations, placement, gravel tailing, rocks, etc.

49. The Contract Clauses and Specifications require that the construction shall be warranted for a period of 1 year from the date of final acceptance of the work (00900 page 6) and that the Contractor is responsible for maintenance and replacements for the plant establishment period for two full growing seasons (01050 page 5). The Specifications state that the Contractor is not responsible for damage resulting from either surface water flow exceeding the design storm or earthquake. Who is responsible for damage or loss due to fire, theft or browsing?

Response: The contractor will be responsible for insuring the plantings are viable at the end of the two full growing seasons. Damage or loss due to fire, theft or browsing is not within the contractor's limits of responsibility.

50. Do the time extensions for unusually severe weather (00800-15) include, not only the actual adverse weather delay day when precipitation occurred, but also the following days when flow is sufficiently deep or of such velocity to preclude construction activities?
Response: Contract specifications section 800, paragraph 52.777-4022, states "adverse weather and resultant impact". This would include work which cannot proceed following precipitation due to flow in the stream which halts construction.

51. What "additional details of the existing condition" are required for the timber bridge (01012 page 6)?

Response: Reference amended specification section 01012.

52. The list of Basic Contract Items lists Item 0069 Large Woody Debris Deflector and Item 0070 Root Wad with large Woody Debris Deflector. Where are the detail drawings for these two items?

Response: These details were not included in the contract package. They will be included with the amendment documentation.

53. Regarding the Step Pools, Drawing Number 65, STEP POOL – POOL B-B' Drawing Number 30 shows step Pools in plan with the pool width about equate to 1x bankfull width. Please explain.

Response: The step pools shown on the Grading and Erosion and Sediment Control drawings are not accurately depicted. The details shown on drawing no. 65 is correct. The width of the steps is 1x bankfull as shown on Section A-A and the width of the pools is 2x bankfull as shown on Section B-B.

54. Regarding the curved rock structures shown on Drawings Number 31, are these Step Pools, J Vanes or something else?

Response: They are step pools (see dwg 50 for a profile view of this reach of Fern Hollow).

55. The design discharge flows for phases 1B and 2 are based on bank full conditions. The design and 100 yr discharges are as follows:

	Bankfull	100-yr
Nine Mile Run above Fern Hollow	1000 cfs	2486 cfs
Nine Mile Run below Fern Hollow to Commercial St.	1200 cfs	3306 cfs
Nine Mile Run below Commercial St. (Phase 2)	400 cfs	3300 cfs
Fern Hollow	100 cfs	589 cfs

Based upon the "Comparison of Hydrologic results Table" contained in appendix B of the Design Analysis report [DAR] (Phase 1B), the design flows roughly corresponds to a 0.5 year return frequency flow. That would mean that on average a storm event of this magnitude would happen twice a year.

The target bankfull shear stress for this project I 1.31 lbs/sf (Page 4-9 of the Phase 1B DAR). However, there is no discussion in the DAR of the stability of the design during extreme flood events. For instance, has an analysis been conducted to ascertain the stability of the features of the 60% final design during and extreme storm event such as a 10-year storm?

Response: No

If such analysis has not been accomplished, is it required that such an analysis is preformed?

Response: No

The contract specifications indicate that the work shall be warranted for two growing seasons following construction, however, it appears that the design storm will be exceeded twice a year. Is the contractor liable for any storm events in the excess of the design storm?

Response:
No, the contractor will not be liable if a storm exceeds the design storm. It is recommended that temporary gages be installed to measure and record the peak flow during actual storm events.

56. Several smaller culverts discharge to Fern Hollow Creek. The design drawings indicate outlet projection at the outfall of these culverts. Have the Protection at these outfalls been designed? Are hydrologic calculations available for these smaller culverts? Are design discharges available for the culvert design requested for Falls Ravine culvert?

Response: Only 2 culverts were noted as requiring additional design details (STA A0+30 +/- and STA B6+20+/-). Some information is provided for these culverts already. The contractor is required to determine if wingwalls or a headwall is necessary at the STA A0+30 culvert. The culvert at STA B6+20+/- does not specify the type of pipe. The contractor is required to provide type of pipe. Design discharges are NOT available for tributaries to 9 Mile Run or Fern Hollow. Standard details for the installation of all culverts are to be provided.

57. Where are the detail drawings for Bid Form Item 0058, Enhanced riffle structures (Phase A)?

Response: Based on the description given in DSP 13-20.1, the enhanced riffles are similar to the riffle structures, but do not include rock. No additional detail is required.

58. Regarding Bid Item 0026, Log Vane on Drawings Number 66, Cross Section A-A' shows on 18-inch diameter log. However, the profile elevation indicates that two logs are needed if 18-inch diameter logs are used. Please clarify.

Response: The <u>minimum</u> diameter of logs used to create log vanes is 18" and the minimum thickness of the log vane structure is 36". If 36" cannot be obtained by one log, 2 logs must be used and the minimum diameter for each log is 18".

59. In regards to Section 52.000-DB04-Responsibility of the Contractor for Design & Section 52.000-DB05 – Warranty of Design.

How does the COE intend to interpret the responsible party for a design error and/or omission, when the permits being obtained for this contract as well as the approval of design plans by the COE are based on 60% design plans prepared by another consultant?

Response: The contractor will be responsible for any features of work they are specified to design as outlined in Section 01012 of the specifications and the contractor will be responsible for the impacts of these features on the existing design. The contractor will not be responsible for any design errors or omissions from the current design.

60. In regards to Section 52.000-DB04-Responsibility of the Contractor for Design & Section 52.000-DB05 – Warranty of Design.

The Contractor's designer, not being part of the initial studies used to develop the design will need to confirm all design components before completing the design for issuance to the Contractor, including H&H studies, effective discharge determinations, suitability of materials based on anticipated flows, Geotechnical information, etc. before their Engineer will sing and seal plans. Should the Contractor's designer identify errors or potential problems in the 60% design, a modification to the plans and possibly the permit will be needed, which would likely take an excessive amount of time and possible cause Contractor delays in completing the project. Is the COE prepared to extend the contract time if flaws are identified in the 60% design and permit modifications are necessary?

Response: The contractor will not be held liable for the 60% design that has been provided. The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design features. They will not be required to sign off and seal any of the existing drawings.

61. In regards to Section 52.000-DB04-Responsibility of the Contractor for Design & Section 52.000-DB05 – Warranty of Design.

If any design revisions recommended are not approved by the COE or permitting agencies, is the COE prepared to accept full liability for sticking with the 60% design and would the COE then be willing to sign and seal the final plans and H&H studies?

Response: The contractor will not be held liable for the 60% design that has been provided. The contractor will be required to have a designer sign off and seal any features of work they are specified to design as outlined in Section 01012 of the specifications. They will be responsible for the impacts of their design on the existing design

features. They will not be required to sign off and seal any of the existing drawings.

62. Section 52.000-DB06 – Warranty of Construction Work

The 60% design plans that have been approved by the COE and are being used to obtain permits include a number of construction access areas and some assumptions that have not been fully engineered or investigated by the Contractor or his designer for constructability or even stability. If the Contractor complies with the approved plans/permits and is not negligent in their actions during construction, would problems that might occur to these facilities as a result of the construction activities are considered and item that fall sunder Government-furnished material or design (item I), that the Contractor would not be liable for repairs if they are found not to be negligent? In particular, I have concerns about the Contractor's running equipment carrying heavy stone over top of the box culvert on Sheets 28 & 29.

Response: As stated earlier, the contractor will only be responsible for the design items listed and will not be responsible for the 60% design plans that have been supplied. As with any construction contract, the Contractor will not be held liable for his actions if they are found NOT to be negligent. As for the box culvert mentioned, see Specifications section 01100 paragraph 1.8, Protection of Utilities.

COMPANY	POC
Biohabitats Inc.	**David Black**
Skelly and Loy, Engineering – Environmental Consultants	**Deborah MacAllister**
Port Vue Plumbing Inc.	**Rich Perkoski**
Tetra Tech NUS, Inc.	**Robert Mertz**
Tetra Tech NUS, Inc..	**Thomas J. Riley**
Tetra Tech NUS, Inc.	**Salverio F. DeBartolo**
John Zottola Landscaping, Inc.	**Paul Zottola**
RVF Limited	**Derek Rhodes**
Coastal Design and Construction, Inc.	**Jim Gunn**
EQR	**Bill Dowling**
Shaw Environmental & Infrastructure, Inc.	**Richard Barringer**
KCI Technologies	**Rich Pfingsten**
Compass Environmental, Inc.	**Stephen McCann**
Civil & Environmental Consultants, Inc.	**John K. Buck**
Civil & Environmental Consultants, Inc.	**Jeff Woodcock**
Aquascape	**Bob Beran**
Aquascape	**Anna McAninch**
Aquascape	**Jeff Reidenbuagh**
Joseph Vacarello Jr. Inc.	**Nicholas Vacarello**
Meadville Land Service	**Michael Ernst**
Renewable Resources	**David M. Ellis**

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	BASIC CONTRACT ITEMS, PHASE 1B BASIC FEATURES				
0001	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS PREMIUM (SEE SECTION 00800)		NOT TO EXCEED		$_____.___
0002	PROGRESS PHOTOGRAPHS (SETS OF 10)	15	SE	$_____.__	$_____.___
0003	STABILIZED CONSTRUCTION ENTRANCE	2	EA	$_____.__	$_____.___
0004	CLEARING AND GRUBBING (INCLUDING TREE REMOVAL)	80,525	SY	$_____.__	$_____.___
0005	**EXCAVATION (CUT AND FILL BALANCE)**	29,737	CD	$_____.__	$_____.___
0006	BORROW EXCAVATION (IMPORTED)	8,415	CD	$_____.__	$_____.___
0007	**EXCAVATION (EXTENSIVE INVASIVE SPECIES CONTROL SOIL REMOVED OFF-SITE)**	4,400	CD	$_____.__	$_____.___
0008	**EXCAVATION (STOCKPILING TOPSOIL)**	2,910	CD	$_____.__	$_____.___
0009	MOBILIZATION	1	LS	SUM	$_____.___
0010	36” REINFORCED CONCRETE PIPE CULVERT	1	LS	SUM	$_____.___
0011	SLOPE EROSION PROTECTION	**3,500**	SY	$_____.__	$_____.___
0012	BITUMINOUS REMOVAL AND DISPOSAL	480	SY	$_____.__	$_____.___
0013	SALVAGING, STOCKPILING AND PLACING CHANNEL BED MATERIALS	4,600	CD	$_____.__	$_____.___
0014	BRUSH PILES (SALVAGE, STOCKPILE, AND PLACE)	29	EA	$_____.__	$_____.___
0015	WOOD SNAGS (SALVAGE, STOCKPILE, AND PLACE)	22	EA	$_____.__	$_____.___
0016	DOWNED LOGS (SALVAGE, STOCKPILE AND PLACE)	62	EA	$_____.__	$_____.___
0017	BITUMINOUS SAWCUT	100	LF	$_____.__	$_____.___
0018	TRANSPORT ROCK AND CONSTRUCT ROCK CROSS VANES	**1**	**EA**	$_____.__	$_____.___
0019	TRANSPORT ROCK AND CONSTRUCT ROCK VANES	**12**	**EA**	$_____.__	$_____.___
0020	TRANSPORT ROCK AND CONSTRUCT ROCK J-VANES	**5**	**EA**	$_____.__	$_____.___
0021	TRANSPORT ROCK AND CONSTRUCT ROCK SPILLWAY WITH LIVE STAKES	32	CD	$_____.__	$_____.___
0022	TRANSPORT ROCK AND CONSTRUCT STEP-POOLS	150	CD	$_____.__	$_____.___
0023	TRANSPORT ROCK AND CONSTRUCT PLUNGE POOL	648	CD	$_____.__	$_____.___
0024	TRANSPORT ROCK AND CONSTRUCT				

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
	BOULDER BANK STABILIZATION	472	CD	$_____.__	$_____.___
0025	LOG BANK PROTECTION	**455**	LF	$_____.__	$_____.___
0026	LOG VANE	**5**	EA	$_____.__	$_____.___
0027	ROOT WAD REVETMENT	76	EA	$_____.__	$_____.___
0028	CATCH BASIN REMOVAL	1	LS	SUM	$_____.___
0029	PUMP AROUND	1	LS	SUM	$_____.___
0030	BLAZE ORANGE FENCE	3,300	LF	$_____.__	$_____.___
0031	PLANTING ZONE 1 – PALUSTRINE SCRUB-SHRUB WETLAND SY	2,295		$_____.__	$_____.___
0032	PLANTING ZONE 2 – PALUSTRINE EMERGENT WETLAND	1,900	SY	$_____.__	$_____.___
0033	PLANTING ZONE 3 – NATIVE MEADOW	2,605	SY	$_____.__	$_____.___
0034	PLANTING ZONE 4 – RIPARIAN WOODLAND	46,515	SY	$_____.__	$_____.___
0035	PLANTING ZONE 5 – MESIC WOODLAND	2,640	SY	$_____.__	$_____.___
0036	PLANTING ZONE 6 – RIPARIAN WOODLAND SUPPLEMENT	630	SY	$_____.__	$_____.___
0037	PLANTING ZONE 7 – PALUSTRINE FORESTED WETLAND	9010	SY	$_____.__	$_____.___
0038	PLANTING ZONE 8 – HUMMOCK WETLAND	6,280	SY	$_____.__	$_____.___
0039	PLANTING ZONE 9 – RIPARIAN SCRUB-SHRUB	2,130	SY	$_____.__	$_____.___
0040	PLANTING ZONE 10 – OXBOW WETLAND - FORESTED	4,685	SY	$_____.__	$_____.___
0041	PLANTING ZONE 11 – SWALE	400	SY	$_____.__	$_____.___
0042	LIVE BRANCH LAYERING	**2,035**	LF	$_____.__	$_____.___
0043	EROSION AND SEDIMENT CONTROL	1	LS	SUM	$_____.___
0044	PLUGGING FALLS RAVINE CULVERT	1	LS	SUM	$_____.___
0045	15” CULVERT, FERN HOLLOW	1	LS	SUM	$_____.___
0046	DESIGN EFFORT	1	LS	SUM	$_____.___
0047	CONSTRUCTION SURVEY	1	LS	SUM	$_____.___
	TOTAL, BASIC CONTRACT ITEMS 0001 THRU 0047 INCLUSIVE				$_____.___

AWARDABLE OPTION ITEMS, GROUP A
(PHASE 2 BASIC FEATURES)

0048	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS PREMIUM, BASIC CONTRACT ITEMS (SEE SECTION 00800)			NOT TO EXCEED	$_____.____
0049	STABILIZED CONSTRUCTION ENTRANCE	4	EA	$_____.__	$_____.___

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0050	CLEARING AND GRUBBING (INCLUDING TREE REMOVAL)	18,495	SY	$_____.__	$_____.___
0051	CLASS 2, CLASS 3, CLASS 4 EXCAVATION	5,825	CD	$_____.__	$_____.___
0052	BORROW EXCAVATION	1,090	CD	$_____.__	$_____.___
0053	STOCKPILING TOPSOIL	1,570	CD	$_____.__	$_____.___
0054	TOPSOIL FURNISHED AND PLACED, EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	3,150	CD	$_____.__	$_____.___
0055	WATER COURSE AND SLOPE EROSION PROTECTION, EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	**9,500**	SY	$_____.__	$_____.___
0056	PUMP AROUND	1	LS	SUM	$_____.___
0057	BLAZE ORANGE FENCE	560	LF	$_____.__	$_____.___
0058	ENHANCED RIFFLES (PHASE A)	3,055	SY	$_____.__	$_____.___
0059	RIFFLE STRUCTURE	3,060	SY	$_____.__	$_____.___
0060	CONSTRUCT ROCK CROSS VANES	610	CD	$_____.__	$_____.___
0061	CONSTRUCT ROCK J-VANES	70	CD	$_____.__	$_____.___
0062	CONSTRUCT BOULDER CLUSTER RANDOM BOULDER	17	CD	$_____.__	$_____.___
0063	CONSTRUCT BOULDER BANK STABILIZATION, EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	745	CD	$_____.__	$_____.___
0064	CONSTRUCT BOULDER STEPS WITH LIVE BRANCH BUNDLES	**321**	LF	$_____.__	$_____.___
0065	ROOT WAD REVETMENT	16	EA	$_____.__	$_____.___
0066	BRUSH PILES (SALVAGE, STOCKPILE, AND PLACE)	3	EA	$_____.__	$_____.___
0067	WOOD SNAGS (SALVAGE, STOCKPILE, AND PLACE)	4	EA	$_____.__	$_____.___
0068	DOWNED LOGS (SALVAGE, STOCKPILE AND PLACE)	4	EA	$_____.__	$_____.___
0069	LARGE WOODY DEBRIS DEFLECTOR	**9**	EA	$_____.__	$_____.___
0070	ROOT WAD WITH LARGE WOODY DEBRIS DEFLECTOR	**6**	EA	$_____.__	$_____.___
0071	LIVE BRANCH LAYERING	**600**	LF	$_____.__	$_____.___
0072	PLANTING ZONE 1 – PALUSTRINE SCRUB-SHRUB WETLAND	485	SY	$_____.__	$_____.___
0073	PLANTING ZONE 3 – NATIVE MEADOW	1,290	SY	$_____.__	$_____.___

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT
0074	PLANTING ZONE 4 – RIPARIAN WETLAND	11,675	SY	$_____.__	$_____.___
0075**AA**	PLANTING ZONE 5 – MESIC WOODLANDS, WITHIN 11 FEET VERTICALLY OF STREAM THALWEG	860	SY	$_____.__	$_____.___
0075BB	**PLANTING ZONE 6 – RIPARIAN WOODLANDS, SUPPLEMENT**	**8,185**	**SY**	**$. **	**$.**
0076	PLANTING ZONE 12 – FRESHWATER WETLAND - SCRUB-SHRUB	**870**	SY	$_____.__	$_____.___
0077	PLANTING ZONE 13 – OXBOW WETLAND - EMERGENT	1,120	SY	$_____.__	$_____.___
0078	EROSION AND SEDIMENT CONTROL	1	LS	SUM	$_____.___
0079	TIMBER BRIDGE REMOVAL	1	LS	SUM	$_____.___
0080	REMOVAL OF SEWER LINE, STA. E8+65	1	LS	SUM	$_____.___
0081	REMOVAL OF SEWER LINE, STA. E32+50	1	LS	SUM	$_____.___
0082	DESIGN EFFORT	1	LS	SUM	$_____.___
0083	CONSTRUCTION SURVEY	1	LS	SUM	$_____.___
	TOTAL, ITEMS 0048 THRU 0083 INCLUSIVE				$_____.___

AWARDABLE OPTIONS, GROUP B
(ADDITIONAL ITEMS, PHASE 2)

0084	REIMBURSEMENT FOR ACTUAL PERFORMANCE AND PAYMENT BONDS PREMIUM, BASIC CONTRACT ITEMS (SEE SECTION 00800)			NOT TO EXCEED	$_____.____
0085	TOPSOIL FURNISHED AND PLACED AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	100	CD	$_____.__	$_____.___
0086	CONSTRUCT BOULDER BANK STABILIZATION AT STABILIZATION AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	105	CD	$_____.__	$_____.___
0087	WATER COURSE AND SLOPE EROSION PROTECTION, AT STABILIZATION AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95)	305	SY	$_____.__	$_____.___
0088	PLANTING ZONE 6 –RIPARIAN WOODLAND SUPPLEMENT	8,165	SY	$_____.__	$_____.___
0089	PLANTING ZONE 14 **SUPPLEMENT MESIC WOODLANDS**	1,730	SY	$_____.__	$_____.___
0090	CONSTRUCT BALLFIELD AREA	1	LS	SUM	$_____.___
	TOTAL, ADDITIVE ITEMS 0084 THRU 0090 INCLUSIVE				$_____.___

*ALL QUANTITIES ARE ESTIMATED, EXCEPT WHERE THE UNIT IS GIVEN AS "LS"

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT

NOTE:ALL EXTENSIONS OF THE UNIT PRICES SHOWN WILL BE SUBJECT TO VERIFICATION BY THE GOVERNMENT.

ONLY UNIT PRICES PLEASE DO NOT ROUND OFF TOTALS. IN CASE OF VARIATION BETWEEN THE UNIT PRICE AND THE EXTENSION, THE UNIT PRICE WILL BE CONSIDERED TO BE THE BID.IF A MODIFICATION TO A BID BASED ON UNIT PRICES IS SUBMITTED, WHICH PROVIDES FOR A LUMP SUM ADJUSTMENT TO THE TOTAL ESTIMATED COST, THE APPLICATION OF THE LUMP SUM ADJUSTMENT TO EACH UNIT PRICE IN THE BID SCHEDULE MUST BE STATED.IF IT IS NOT STATED, THE BIDDER AGREES THAT THE LUMP SUM ADJUSTMENT SHALL BE APPLIED ON A PRORATA BASIS TO EVERY UNIT PRICE IN THE BID SCHEDULE.

IF ITEMS NOS. 0001, 0048 AND **0084** ARE NOT APPLICABLE BECAUSE THE BID IS UNDER $25,000, THE BIDDER SHOULD STATE "N/A" IN THE SPACE PROVIDED FOR THE AMOUNT.

THE FOLLOWING IS A LIST OF ABBREVIATIONS AND THEIR MEANINGS AS USED IN THE PRICE SCHEDULE UNDER U/M (UNIT OF MEASURE):

CD	CUBIC YARDS
EA	EACH
LF	LINEAR FEET
LS	LUMP SUM
SE	SETS
SY	SQUARE YARDS

All bidders shall furnish the following information with their bid. Failure to furnish this information will render your bid as non-responsive and it will not be considered.

1. Provide the resume of your fluvial geomorphologist with at least 7 years of working experience as a geomorphologist and list at least 4 natural stream realignment projects for the purposes of aquatic stream restoration they have designed. Include in their resume the project name, the dates of construction and name and telephone number of project owner.
2. Provide a list of at least 2 aquatic stream restoration projects within the past 10 years for which your design firm has been the designer of record, dates of construction and name and telephone number of project owner.
3. Provide a list of at least 2 stream realignment projects for the purposes of aquatic stream restoration and 2 projects which utilized bioengineered solutions within the past 10 years, on which your firm has been the prime construction contractor. Provide the dates of construction and name and telephone number of project owner.
4. Provide a list of at least 2 projects with planting schedules requiring a minimum of 10 acres of plantings with a diversity of 50 plant species or more that you have completed within the past 10 years. Provide the dates of construction and name and telephone number of project owner.

ITEM	DESCRIPTION	* QUANTITY	U/M	U/P	AMOUNT

5. Provide a list of at least 2 construction projects within the past 10 years in which non-tidal wetland and non-perennial riparian wetlands construction was required. Provide the dates of construction and name and telephone number of project owner.

For Criteria 2 through 5, firms that have been established for less than 5 years may provide the following information in lieu of requested information: the key members within the firm that have the specific experience requested, details of their role in that capacity, the date of experience, the name and telephone number of the project owner.

SECTION TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01012

DESIGN AFTER AWARD

-- End of Section Table of Contents --

SECTION 01012

DESIGN AFTER AWARD

PART 1 GENERAL REQUIREMENTS

1.1 GENERAL

The Contractor shall schedule the number and composition of the design submittal phases. Design submittals are required for any extension or revision of the design shown in the contract plans and specifications. The requirements are listed hereinafter. The Contractor shall reflect the number and contents of the design submittals phases in the progress charts. The design submittal shall be made in only one package for the categories listed in Paragraph CONTENTS OF DESIGN SUBMITTALS. More than one category may be combined in a submittal.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ATTACHMENTS (Attachment)

Attachment 1	General Design Guidance and Criteria
Attachment 3	Submittal Register - ENG Form 4288
Attachment 6a	Permits Phase (60% Final) Specifications
Attachment 6b	Permits Phase (60% Final) Plans
Attachment 7a	Phase 1B, Design Analysis Report, 60% Final Design Submission
Attachment 7b	Phase II, Design Analysis Report, 60% Final Design Submission
Attachment 15	Future Ball Field Site for the City of Pittsburgh
Attachment 16	Report of Survey

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 1110-1-1005	(1994) Topographic Surveying

1.3 ABBREVIATIONS

The following abbreviations are used throughout this specifications.

ACO	Administrative Contracting Officer
ADPS	Automatic Data Processing Systems
CADD	Computer-Aided Design and Drafting
COR	Contracting Officer's Representative
DOR	Designer of Record
RFI	Request for Information
IFB	Invitation for Bids

1.4 DESIGNER OF RECORD

The Contractor shall identify a Designer of Record (DOR) for each design area specified in paragraph Design Elements. All design disciplines shall be accounted for by listed, registered Designer(s) of Record. Each DOR shall be responsible for ensuring integrity of their design and design integration in all construction submittals and extensions to design developed by others, such as the constructor, subcontractors or suppliers. Each DOR shall review and approve all construction submittals and extensions to design, in accordance with the procedures described in Section 01330 SUBMITTALS. Each DOR shall be responsible for responses to Requests for Information (RFI), applicable to their area of design responsibility.

Each DOR shall stamp, sign, and date all design drawings and reports under their responsible discipline at each design submittal stage (see Section 00700 CONTRACT CLAUSES, paragraph REGISTRATION OF DESIGNERS) and all submittals under their responsible discipline, in accordance with the submittal review procedures. Each DOR shall sign-off on all RFI responses under their discipline. Design drawings are any additional design required or additions or extensions of the design shown on the contract drawings. The DOR will not be responsible for signing the contract drawings furnished with the contract.

1.5 DESIGN CONFERENCES

1.5.1 Pre-Work

As part of the Pre-Work Conference conducted after contract award, key representatives of the Government and the Contractor will review the design submission and review procedures specified herein, discuss the preliminary design schedule and provisions for phase completion of the Design-Build documents with construction activities (fast tracking), as appropriate, meet with Corps of Engineers Design Review personnel and any other appropriate pre-design discussion items.

1.5.2 Design Review Conferences

Review conferences will be held on base for each design submittal. The Contractor will bring the personnel that developed the design submittal to the review conference. The conferences will take place the week after the review is complete.

1.6 DESIGN REQUIREMENTS

The Contractor shall be responsible for the preparation of final plans and specifications for additonal design as specified and any additions or extensions to the design shown on the contract drawings which document all necessary modifications to the existing design. Under the design, the Contractor shall be responsible for developing final construction documents, which include:

1. Design calculations

2. Construction drawing updates

3. Specification updates

4. Quantity updates - Complete Survey of all the work to include the layout of the new thalwag of the streams; cross sections of the streams and the proposed cut/fill lines; quantity computation of all bid items;

and final configuration and dimensions of all features. In addition, the contractor shall stake or flag the LOD and Planting Zones and furnish all quantity computations of these listed items.

The design shall be developed by taking advantage of the existing bidding documents. It should be noted that any changes in the design that require modifying the existing Erosion and Sedimentation Control plans or Permits is not recommended and will be thoroughly reviewed by the Corps for necessity and impact to the project. All design changes shall be submitted to the Corps in the form of construction submittals unless otherwise noted.

1.6.1 Government Furnished Data

The Corps of Engineers will furnish the following items for the completion of design:

a. Plans and Specifications - Upon award of the contract the Government will provide electronic copies of the plans (Attachment 6b) in Microstation (dgn) format and the specifications (Attachment 6a) in Microsoft Word format. The contractor shall furnish engineering services, materials, supplies, plant, labor, equipment, and travel to complete the design as described herein. All changes or additions made to the design drawings will be done in Microstation.

b. Hydraulic Data - The Government has provided the hydraulic data for this project in the Design Analysis Reports for Phases 1B and 2 (Attachment 7a and Attachment 7b). Additional HEC-RAS output data will be furnished to the Contractor upon the award of the design/build contract upon request. The hydraulic data provided shall be used to complete the current plunge pool design and culvert designs and to make any other design changes.

c. Surveying Pins - Survey monument pins have been located in Frick Park. The project utilizes 3 monuments pairs (6 bronze disk monuments total) plus photo control stations. The location of these pins will be furnished to the Contractor upon award of the contract. Attachment 16 describes the existing survey information.

1.6.2 Design Elements

The Contractor shall complete the design of the following items but not necessarily limited to the following:

- Nine Mile Run - Proposed plunge pool
- Nine Mile Run - Remove and plug two existing abandoned sewer crossings per PWSA standards (Pittsburgh Water and Sewer Authority)
- Nine Mile Run - Bridge Removal
- Falls Ravine - Plug existing culvert that directs Falls Ravine into Fern Hollow
- Falls Ravine - Culvert at Sta 0+38
- Fern Hollow Creek - 15" diameter tributary pipe
- Overall - Provide additional cross sections and profiles.

Additional design requirements for these elements of the project that require additional design beyond that given in the 60% Final Drawings and Specifications (Attachment 6b and Attachment 6a) are identified in TABLE 1.

DESIGN ELEMENTS

Nine Mile Run

1. Plunge Pool - A profile view of the proposed plunge pool is provided in the contract drawings along with information in the specifications. The rock needed for the construction of the plunge pool is provided as Government-furnished materials. The Contractor shall provide additional details on the design of the plunge pool using the Government-furnished rock.

2. Abandoned Sewer Lines. Existing sewer lines that are owned by the Pittsburgh Water and Sewer Authority (PWSA) are to be abandoned by PWSA. PWSA is in the process of constructing new sewer lines and abandoning existing lines within the project limits. At the locations noted on the drawings, the Contractor shall coordinate the removal and plugging of the abandoned sewer lines with the PWSA. All work shall be in accordance with PWSA standards. Details shall be provided on how the abandoned lines are to be removed and plugged.

3. Abandoned Bridge. The Contractor shall provide additional details of the existing condition of the abandoned bridge in Nine Mile Run and the site conditions after the bridge has been removed from the channel. The Contractor's plan for removing the bridge abutments shall widen the channel at the bridge abutments while minimizing the disturbance of the adjacent banks. The Contractor's design submittal shall include a bridge removal plan that provides information on how the bridge structure is to be removed, plan and typical sections of the existing bridge, and plan and sections showing the proposed restoration of the stream and streambank.

4. Ball Field. The Contractor shall provide additional details for construction of the City of Pittsburgh ball field in accordance with the guidance provided in Attachment 15. The design shall include existing condition of the site, grading plan, cross sections, and subdrainage system.

Falls Ravine

1. Existing Stream. Falls Ravine is currently culverted from approximate Sta A0+00 to Fern Hollow Creek in the vicinity of the existing foot bridge. This culvert is only noted on the drawings and the exact location is not shown. The Contractor shall provide details of how this culvert will be abandoned and plugged.

2. New Culvert. A new 12-linear foot, 36" diameter culvert is proposed for Falls Ravine between Sta A0+38 and Sta A0+50. The Contractor shall provide additional details, per PDT Standards, for this culvert. In addition to standard construction details of the culvert, the Contractor shall determine if a headwall or wing walls are needed and furnish appropriate design details. An equitable adjustment in the contract price will be made in accordance with Section 00700, paragraph CHANGES.

Fern Hollow

1. A 15" diameter drain pipe is proposed to connect an existing tributary to Fern Hollow Creek. The 15" diameter drain pipe is located under the entrance road to Frick Park and enters Fern Hollow at approximate Sta B6+20. The Contractor shall provide additional design for this pipe. The design shall be in accordance with PDT Standards and shall include features such as, but not limited to: type of pipe, invert elevations, placement details, etc.

Profile and Cross Sections Drawings

As part of the As-built submittal, the Contractor shall provide new cross-sections and profile drawings. Based on the baseline that is provided in the plans, the Contractor shall create new cross-sections a minimum of every 200 feet along Nine Mile Run, Falls Ravine, and Fern Hollow. Additional cross sections shall be provided at the Bridge Removal and Plunge Pool, and a longitudinal and transverse cross section shall be provided at each new wetland area. The Contractor shall create new profiles of Nine Mile Run, Falls Ravine, and Fern Hollow. The cross sections shall show design features such as, but not limited to: the Existing and Proposed Ground Line, Water Elevation, Bank Full Limit, Boulder Bank, Rock "J" Vane, Rock Cross Vanes Root Wad, Erosion Control Material, Live Branch Layering, Riffle Structures, transition from new contours to existing contours, etc. The profiles shall show design features such as, but not limited to: the Existing and Proposed Ground Line at the Thalwag, Bankfull Limit, Water Elevation, Riffle Structures, Enhanced Riffle Structures, Step Pool Rocks, Existing/Proposed culverts or Sewer Crossings, etc.

1.7 DESIGN SUBMITTAL

The review of this submittal is to insure that the design is in accordance with directions provided the Contractor during the design process.

1.7.1 Design Analysis

The Design Analysis submitted for Design Review shall be in its final form. The Design Analysis shall include all backup material previously submitted and revised as necessary. All design calculations shall be included. The Design Analysis shall contain all explanatory material giving the design rationale for any design decisions, which would not be obvious to an engineer reviewing the Final Drawings and Specifications.

1.7.2 Contract Drawings

The Contract Drawings submitted for Design Review shall include the contract drawings which have been revised and completed as necessary. The Contractor is expected to have completed all of his coordination checks and have the drawings in a design complete condition. The drawings shall contain all the details necessary to assure a clear understanding of the work throughout construction. Shop drawings will not be considered as design drawings. All design shall be shown on design drawings prior to submittal of shop drawings.

1.7.3 Specifications

The Specifications on all items of work submitted for Design Review shall consist of legible marked-up specification sections.

1.7.4 Beginning Construction

The Contractor may begin construction on portions of the work for which the Government has reviewed the Final Design Submission, Survey Data and Layout for the features of work in the area and has determined it to be satisfactory for purposes of beginning construction. Survey Data and Layout requirements are specified in Section 01050 SCOPE OF WORK, paragraph Special Contract Requirements. The Administrative Contracting Officer (ACO) or Contracting Officer's Representative (COR) will notify the

Contractor when the ~~design~~area is cleared for construction. The Government will not grant any time extension for any design re-submittal required when, in the opinion of the ACO or COR, the initial submission failed to meet the minimum quality requirements as set forth in the Contract. If the Government allows the Contractor to proceed with limited construction based on pending minor revisions to the reviewed Final Design submission, no payment will be made for any in-place construction related to the pending revisions until they are completed, resubmitted with the Design Complete Submittal and are satisfactory to the Government.

1.7.5 Submission of Design Complete Submittal

The Contractor shall submit the Design Complete Submittal not later than 30 calendar days after the Government returns the annotated Final Conformance Review Submittal. Submittals shall be submitted in accordance with Section 01330 SUBMITTAL REQUIREMENTS.

1.7.6 Revisions to the Reviewed Design

The Designer of Record must approve and the Government must concur with any Contractor proposed revisions to the Contractor's Government reviewed and concurred design.

1.7.6.1 Government Non-Concurrence

The Government reserves the right to non-concur with any revisions to the design, which may impact on the function of the overall project as presented in Attachment 1.

1.7.6.2 Deviations from Contract Requirements

Any revisions to the design, which deviate from the contract requirements (i.e., the Invitation for Bids (IFB)), will require a modification, pursuant to Section 00700 CONTRACT CLAUSES, paragraph CHANGES, in addition to Government concurrence.

1.7.6.3 Responsibility for Cost

Unless the Government initiates a change to the contract requirements, or the Government determines that the Government furnished design criteria are incorrect and must be revised, any Contractor initiated proposed change to the contract requirements, resulting in additional cost, shall strictly be at the Contractor's expense.

1.7.6.4 Tracking Approved Changes

The Contractor shall track all approved revisions to the reviewed and accepted design and shall incorporate them into the as-built design documentation, in accordance with agreed procedures.

1.8 QUANTITY OF DESIGN SUBMITTALS

1.8.1 General

The Contractor shall submit the documents listed and generally described hereinafter to the Government. Unless otherwise indicated, the Contractor shall submit 6 copies of each item required to be submitted at the Final Conformance Review Submittal stages. All drawings for review submittals shall be half-size black lines.

1.9 MAILING OF DESIGN SUBMITTALS

1.9.1 Overnight Mailing

Mail all design submittals to the Government during design and construction, using an overnight mailing service. The Government will furnish the Contractor addresses where each copy shall be mailed to after award of the contract.

1.9.2 Transmittal Letter

Each design submittal shall have a transmittal letter accompanying it indicating the date, design percentage, type of submittal, list of items submitted, transmittal number and point of contact with telephone number.

1.10 COORDINATION

1.10.1 Written Records

Prepare a written record of each design site visit, meeting, or conference, either telephonic or personal, and furnish within five working days copies to the Contracting Officer and all parties involved. The written record shall include subject, names of participants, outline of discussion, and recommendation or conclusions. Number each written record for the particular project under design in consecutive order.

1.10.2 Design Needs List

Throughout the life of his contract the Contractor shall furnish the COR a biweekly "needs" list for design related items. This list shall itemize in an orderly fashion design data required by the Contractor to advance the design in a timely manner. Each list shall include a sequence number, description of action item, name of the individual or agency responsible for satisfying the action item and remarks. The list will be maintained on a continuous basis with satisfied action items checked off and new action items added as required. Once a Request for Information is initiated, that item shall remain on the list until the requested information has been furnished or otherwise resolved. Copies of the list will be mailed to both the Administrative Contracting Officer and the agencies tasked with supplying the information.

1.11 GOVERNMENT REVIEW COMMENTS

1.11.1 Review Schedule

Within 21 days after Notice to Proceed, the Contractor shall submit, for approval, a complete design schedule with all submittals and review times indicated in calendar dates. The Contractor shall update this schedule monthly.

1.11.2 Government Review Time

After receipt, the Government will be allowed 30 days to review and comment on each 95% design submittal, except as noted below. For each design review submittal, the COR will furnish the Contractor comments from the various design sections and from other concerned agencies involved in the review process. The review will be for conformance with the technical requirements of the solicitation and the Successful Offeror's

(Contractor's) bid. If the Contractor disagrees technically with any comment or comments and does not intend to comply with the comment, he must clearly outline, with ample justification, the reasons for noncompliance within five days after receipt of these comments in order that the comment can be resolved. All comments must be mutually resolved by the Government and the Contractor. The Contractor shall furnish disposition of all comments, in writing, with the next scheduled submittal. The Contractor is cautioned in that if he believes the action required by any comment exceeds the requirements of this contract, that he should take no action and notify the COR in writing immediately. Review conferences will be held for each design submittal at the Pittsburgh District office. The Contractor shall bring the personnel that developed the design submittal to the review conference. These conferences will take place the week after the twenty-one day review period.

1.11.3 Late Submittals

If a design submittal is over one day late in accordance with the latest design schedule, the Government review period may be extended seven days. The review conference will be held the week after the review new period. Submittals date revisions must be made in writing at least one week prior to the effect submittal.

1.12 DESIGN ANALYSIS

1.12.1 Media and Format

Present the design analysis on 8-1/2-inch by 11-inch paper except that larger sheets may be used when required for graphs or other special calculation forms. All sheets shall be in reproducible form. The material may be typewritten, hand lettered, handwritten, or a combination thereof, provided it is legible. Side margins shall be 1-inch minimum to permit side binding and head to head printing. Bottom margins shall be 1-1/4-inches, with page numbers centered 1 inch from the bottom.

1.12.2 Organization

Assign the several parts and sheets of the design analysis a sequential binding number and bind them under a cover indicating the name of the facility and project number, if applicable. The title page shall carry the designation of the submittal being made. The complete design analysis presented for final review with the final drawings and specifications shall carry the designation "FINAL DESIGN ANALYSIS" on the title page.

1.8.3 Design Calculations

Design calculations are a part of the design analysis. When they are voluminous, bind them separately from the narrative part of the design analysis. Present the design calculations in a clean and legible form incorporating a title page and index for each volume. Furnish a table of contents, which shall be an index of the indices, when there is more than one volume. Identify the source of loading conditions, supplementary sketches, graphs, formulae, and references. Explain all assumptions and conclusions. Calculation sheets shall carry the names or initials of the computer and the checker and the dates of calculations and checking. As part of the Contractor's Quality Control System, no portion of the calculations shall be computed and checked by the same person.

1.13 DRAWINGS

The 60% Final Drawings (Attachment 6b) have been prepared in accordance with Pittsburgh District Drawing Standards in effect at the time of the design. Any additional drawings or revisions to the existing drawings shall be prepared in sufficient detail to permit review by the Contracting Officer for conformance with the design criteria and permits.

1.14 SPECIFICATIONS

1.14.1 Source of Specfications

In general, the specifications (Attachment 6a)are based on the 2000 edition of the Pennsylvania Department of Transportation (PDT) Form 408 Specifications with additional Special Provisions for work which is not covered by the PDT specifications and and The Commonwealth of Pennsylvania, Department of Environmental Protection, Office of Water Management, Erosion and Sediment Control Program Manual dated March 2000. The General Provisions of PDT Form 408 do not apply to this contract. Additional specifications or revisions to the existing specifications shall be prepared in sufficient detail to permit review by the Contracting Officer for conformance with the design criteria and permits.

1.14.2 Submittal Register

Attachment 3 includes a submittal register showing items of equipment and materials for which submittals are required by the Permits Phase (60% Final) Specifications (Attachment 6a); this list may not be all inclusive and additional submittals may be required. The Contractor's Designer(s) of Record shall develop a complete list of additional submittals during design. The Designer of Record shall identify required submittals in the specifications. The Contractor shall maintain a submittal register for the project in accordance with Section 01330 SUBMITTAL REQUIREMENTS.

1.15 SURVEYING & MAPPING

1.15.1 General

The Contractor shall provide any necessary survey in accordance with the requirements below. Any questions regarding survey requirements and procedures may be found in EM 1110-1-1005.

1.15.1.1 District Point-of-Contact

Contact CELRP-EC-GM at (412) 395-7328 regarding specific questions, manuals, station descriptions and monument designations.

1.15.1.2 Scope of Work

Provide a written scope of work to the survey crew (s) performing this work. All surveying and mapping shall be accomplished under the direction of a Pennsylvania Registered Land Surveyor.

1.15.2 Horizontal and Vertical Control:

1. Establish horizontal and vertical control of third order or better shall be established from the existing control located in the vicinity of the mapping area. Descriptions and coordinates of existing monuments may be obtained from CELRP-EC-GM. Horizontal control may be established by GPS positioning. See subparagraph 6. "GPS Control".

2.~~2~~ Tie the horizontal control to the Local State Plane Grid Coordinate System (NAD 27 or NAD 83). Tie all elevations to the NGVD (NGVD29) with no less than third order accuracy and procedures.

~~3. Establish a minimum of three permanent survey monuments on or adjacent to the design site. Survey monuments must be established in areas that will not be disturbed prior to and during the construction phase of the project. Stamp designation and date established on each survey monument. No less than third (3rd) order horizontal and vertical control shall be established on each survey monument. Indicate a detailed description with horizontal and vertical datum on the site plan survey and design drawings. The Survey monument established on site shall meet the minimum technical standards for the Commonwealth of Pennsylvania.~~

~~4~~3. Record survey notes in accordance with EM 1110-1-1005 and submit original fieldwork.

~~5~~4. The Contractor shall complete and submit with field books, the field adjustment computation sheets. The Contractor shall also furnish a sketch of the traverse on an 8-1/2" x 11" sheet of paper, showing the proper orientation of the traverse.

~~6. GPS Control:~~

~~a. GPS positioning may be used to establish new horizontal control at the project site. Second Order observation procedures shall be employed as described in EM 1110-1-1005.~~

~~b. All components of a system shall be test certified by the Federal Geodetic Control Committee and meet the approval of the Cartography, Geodesy and Photogrammetry Section prior to any work. This includes:~~

~~1) Receivers~~

~~2) Antennas~~

~~3) Data recording units and storage medium~~

~~4) Post processing hardware and software~~

~~c. Complete post processing procedures according to EM 1110-1-1005.~~

1.15.3 Survey Requirements:

1. Establish a sufficient quantity of horizontal and vertical control to provide a detailed topographic surveys with contour lines for the area to be surveyed.

2. Provide spot elevations affecting design of facilities such as ground elevations, elevations on existing utilities, and on visible surface features within the area to be surveyed.

3. Show and identify all surface and subsurface features within the area to be surveyed on the topographic maps. Locate these features by sufficient distance ties and label on the topographic sheets to permit accurate scaling and identification. Where possible, contact the local

utility companies to assist in locating underground lines. Open all manholes and show pipe sizes and invert elevations.

4. Refer to EM 1110-1-1005 for further specifications concerning procedure, data and accuracy requirements.

~~5. If required, stake and provide coordinates and elevations for soil borings to be drilled or provide positions of the borings if already drilled. Horizontal accuracy shall be within one (1) foot and vertical accuracy shall be within 1 /10 of a foot. Provide a tabulated list of the coordinates and elevations.~~

1.15.4 Mapping Accuracy Requirements

The mapping shall meet the minimum standards for control surveys, National Map Standards as described in EM 1110-1-1005.

1.15.5 Site Plan Drawing(s)

Show all permanent survey monuments established on site on the ~~final design~~ As-Built drawing(s). Inserts on the drawing(s) and/or digital files shall show a detailed sketch of the location with description of the permanent monuments established on site. Course chart on the drawing(s) shall show coordinate and vertical values of each permanent monument. The following is a example of a course chart:

(NAME OF PROJECT AND LOCATION)

DESIGNATION OF POINT	TYPE MARK DATE	NORTHING NAD27	EASTING NAD 27	ELEVATION NGVD29
21A-3B	CONC. MON, 1994	345,123.34 (ME)	1,234,456.00(ME)	234.56 FT
21A-3C	REBAR	345,140.66	1,234,400.56	246.98 FT
BB-3	REBAR	345,340.45	1,234,645.14	76.33 M
21A-3D	CONC. MON 1994	345,450.98	1,234,823.34	77.45 M

1.15.6 Digital Data:

1. Digitize the topographic and surface feature data into Intergraph IGDS 3D design file(s) and into a TTN file according to the specifications.

2. Following the completion of construction and prior to final acceptance of the project, the Contractor shall provide a complete set of digitized as-built design and construction drawings in Intergraph format (.dgn).

3. The Contractor shall provide the Government with a copy of the design and TTN files on a 1.2-MB high-density disk formatted with MS-DOS version 3.0 or higher, or mini data cartridge. The disk(s) or mini data cartridge shall contain the cell library used to create the drawing(s) and a label shall be attached to the disk/tape showing the project name, location, date, contractor's name, name of files, format and backup procedure.

4. The Contractor shall keep a copy of the digital data for a period of one year from the date of final Government acceptance. The digital

data shall be made available to the Government upon request, at no additional cost.

1.15.7 Quality Control

Each field book, computation sheet, topographic sheet, bridge detail and any other work submitted to the Surveys and Mapping Section (CELRP-EC-GM) shall be reviewed and certified as correct by the Registered Land Surveyor of the State in which the project is located as follows: "I certify the data has been reviewed and meets the minimum standards for control surveys, National Map Standards and requirements of Contract ___" (signature and registration number).

1.11.8 Submittals

Deliver the following items upon the completion of surveying and mapping:

Field books and adjusted computation sheets.

Sketch of traverse (8 1/2 x 11).

Station descriptions.

Intergraph digital data of the survey.

Intergraph digital data of as-built drawings.

~~Letter from RLS stating that mapping meets National Mapping Standards.~~

~~When applicable:~~

~~Tabulated listing of core drill hole positions. GPS log sheets.~~

~~Satellite range data observations diskettes. Baseline processing sheets.~~

1.16 CONTENTS OF DESIGN SUBMITTALS

1.16.1 Design Submittals

The design submittals shall contain, as a minimum, the following items for all submittals:

1. A complete set of construction documents plans and specifications at the same level of detail as shown on the existing plans and specifications (Attachment 6a and Attachment 6b) including a complete list of materials to be used. All details shall be shown on the drawings.

2. The design analysis supports and verifies that the design complies with the requirements of the project.

3. Submit marked-up specifications. The specifications shall be coordinated with the drawings and describe in detail all items shown on the drawings.

1.16.1.1 Landscape

Planting design drawing(s) shall include a complete schedule of plant materials which indicates their botanical and common names, plan symbols,

quantities, sizes, condition furnished, and pertinent remarks. Drawing shall correspond with the site layout and grading plans and reference coordinates, north arrows, graphic scales and appropriate legends. An overall planting layout shall be developed and shall include enlarged detail plans of specific areas as needed, to clarify requirements.

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01050

SCOPE OF WORK

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SECTION 01050

SCOPE OF WORK

PART 1 GENERAL

1.1 General Information

1.1.1 Purpose And Intent

The scope of work is to construct the proposed aquatic ecosystem restoration project in Phase 1B and Phase 2 of the project as identified in Attachment 4. Contractors for the City of Pittsburgh have completed preliminary design, including plans and specifications, to a level necessary for obtaining permits (Attachment 6a and Attachment 6b) and have obtained permits for the construction (Attachment 8, Attachment 9, Attachment 10, Attachment 11, Attachment 12, Attachment 13, and Attachment 14). The construction shall satisfy all applicable safety, health, and environmental laws and regulations. Any additional details required for the construction or deviations from the plans and specifications furnished with this Scope of Work shall be submitted for review and approval by the Contracting Officer in accordance with Section 01012 DESIGN AFTER AWARD.

1.1.2 Background And Description

This project consists of an aquatic ecosystem restoration project to restore aquatic habitat and fish and wildlife resources along the Nine Mile Run channel and the adjacent flood plain and overbank areas. For construction purposes, the project has been divided into three phases, as identified in Attachment 4. Design and construction of Phase 1A has been completed by the City of Pittsburgh (the local cost-sharing sponsor). The remaining portion of the aquatic restoration project (Phases 1B and 2) are included in this contract. The work in Phase 1B will consist of, but not be limited to, the following general features of work:

1. Remediate existing fish migration barriers
2. Stabilize and improve the stream channel, stream alignment, stream banks, and invert profile grade to provide hydraulic and habitat diversity using "green engineering" methods and fluvial geomorphological principles
3. "Daylight" stream reaches that are currently contained in culverts
4. Restore access for the channel to adjacent floodplains during storm events using geomorphological principles
5. Create a variety of aquatic habitats and introduce morphological structures
6. Enhance and/or create wetlands and infiltration basins in the Nine Mile Run and Fern Hollow floodplains to moderate hydrologic extremes and enhance water quality
7. Enhance shade cover over the stream, enhance riparian habitat, and reforest the floodplain with native trees, shrubs and understory plants
8. Maintain erosion control for the soil stockpile at the ball field area in accordance with Erosion & Sediment Control Report and Computations - Phase 1A, NPDES Permit No. PA-R 10-A542 (Attachment 8) and Nine Mile Run Aquatic Ecosystem Restoration Project - Phase 1A, Joint Permit Application - Pennsylvania Water Obstruction and Encroachment Permit and U.S. Army Corps of Engineers Section 404 Permit

(Attachment 9)

The following items of work that are physically part of Phase 1B have been completed, by the City of Pittsburgh contract:

1. Partial wetland excavation, Reach 2A
2. Invasive species control
3. Development of access road
4. Furnishing stone for the various features of work. (See also paragraph GOVERNMENT-FURNISHED MATERIALS

The work in Phase 2 will consist of, but not be limited to, the following general features of work:

1. Remediate existing fish migration barriers
2. Stabilize and improve the stream channel, stream alignment, stream banks, and invert profile grade to provide hydraulic and habitat diversity using "green engineering" methods and fluvial geomorphological principles
3. Create a variety of aquatic habitats and introduce morphological structures
4. Remove and plug two reaches of abandoned sewer line
5. Plant native species

1.2 REFERENCES

The documents listed below form a part of these plans and specification to the extent referenced. The publications are referred to in the text by basic number only.

ATTACHMENTS (Attachment)

Attachment 1	General Design Guidance and Criteria
Attachment 4	Phases of Design and Construction
Attachment 6a	Permits Phase (60% Final) Specifications
Attachment 6b	Permits Phase (60% Final) Plans
Attachment 7a	Phase 1B, Design Analysis Report, 60% Final Design Submission
Attachment 7b	Phase II, Design Analysis Report, 60% Final Design Submission
Attachment 8	Erosion & Sediment Control Report and Computations - Phase 1A, NPDES Permit No. PA-R 10-A542
Attachment 9	Nine Mile Run Aquatic Ecosystem Restoration Project - Phase 1B, Joint Permit Application - Pennsylvania Water Obstruction and Encroachment Permit and U.S. Army Corps of Engineers Section 404 Permit
Attachment 10	Erosion and Sedimentation Control Plan - Phase 1B
Attachment 11	Nine Mile Run Aquatic Ecosystem Restoration Project - Phase 2, Joint Permit Application - Pennsylvania Water Obstruction and Encroachment Permit and U.S. Army Corps of Engineers Section 404 Permit
Attachment 12	Erosion and Sedimentation Control Plan - Phase 2 (Application only, the actual

	permit will be furnished when received from the City of Pittsburgh)
Attachment 13	Phase 1B Section 401 and Section 404 Permits
Attachment 14	Phase 2 Section 401 and Section 404 Permits (Application only, the actual permits will be furnished when received from the City of Pittsburgh)

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(1996) U.S. Army Corps of Engineers Safety and Health Requirements Manual

1.3 DESIGN EFFORT

The Permit Phase (60% Final) Plans and Specifications (Attachment 6a and Attachment 6b) furnished reflect design beyond that required for obtaining the permits. The Contractor may utilize the design as shown or provide variations, provided the variations satisfy the functional intent of the project and comply with all approved permits. Such variations shall be submitted using additional details and/or work plans. This design effort will be considered as incidental to the construction, and will be included in the construction submittal review and approval process. The Contractor shall review the following:

1. Permits Phase (60% Final) Plans and Specifications (Attachment 6a and Attachment 6b)
2. Design Analysis Reports (Attachment 7a and Attachment 7b)
3. Erosion & Sediment Control Report and Computations - Phase 1A, NPDES Permit No. PA-R 10-A542 (Attachment 8)
4. Nine Mile Run Aquatic Ecosystem Restoration Project, Joint Permit Applications, Pennsylvania Water Obstruction and Encroachment Permits, and U.S. Army Corps of Engineers Section 404 Permits (Attachment 9, Attachment 11, Attachment 13, and Attachment 14)
5. Erosion and Sedimentation Control Plans (Attachment 10 and Attachment 12)
6. Other requirements and documents listed in General Design Guidance and Criteria (Attachment 1)
7. Requirements for Future City of Pittsburgh Ball Field (Attachment 15).

The design reflected in the attached plans and specifications is based on compliance with the goals of the Recommended Plan for the project, permits obtained by the City of Pittsburgh, and other standards. The Contractor is advised that deviations from the plans or specifications (e.g., proposed alternate staging areas, alternate access routes, etc.) could result in the requirement for the Government to reanalyze the project from an environmental standpoint. Deviations from the construction methods and procedures indicated by the plans and specifications which may have an impact related to the permits will require an extended review, processing, and approval time by the Government. The Contracting Officer reserves the right to disapprove alternate methods, even if they are more cost effective, if the Contracting Officer determines that the proposed alternate method will have an adverse environmental impact.

The Permit Phase (60% Final) Plans and Specifications (Attachment 6a and Attachment 6b) furnished may deviate from the plans and specifications attached to the permits. These deviations are, in general, the result of

corrections to and clarifications of the documents. Where these deviations occur, construction shall be in accordance with the Permit Phase (60% Final) Plans and Specifications (Attachment 6a and Attachment 6b). The environmental features of the project must comply with all details included in the permit application package as shown in Nine Mile Run Aquatic Ecosystem Restoration Project Permits (Attachment 9, Attachment 11, Attachment 13, and Attachment 14 and Erosion and Sedimentation Control Plans (Attachment 10 and Attachment 12) including the following items:

1. Erosion and Sedimentation Controls
2. Location of laydown and storage areas
3. Channel revetment type and location
4. Stream alignment

Erosion & Sediment Control Report and Computations - Phase 1A, NPDES Permit No. PA-R 10-A542 (Attachment 8) has been included because the area is currently being used as a stockpile area for Government-furnished stone and may be used as a laydown and storage area. This area is covered by Erosion and Sedimentation Control Plan (Drawings 11 and 12) of permit PA-R-10-A542 for Phase 1A.

The Contractor may develop additional details as required for the construction, however such new details shall comply with the design guidance furnished.

1.4 DRAWINGS AND SPECIFICATIONS

Drawings and specification revised or added by the Contractor shall be prepared in accordance with Section 01012 DESIGN AFTER AWARD.

1.5 CONSTRUCTION

Construction shall commence upon approval of the Accident Prevention, Quality Control, Environmental Protection, ~~and~~ Waste Management plans and Schedule, and the required Survey Data, Layout, and any required additional design.

1.5.1 Construction Restrictions

The following restrictions shall apply to the construction phase:

a. Work shall be performed only during daylight hours. It should be noted that the area of Frick Park where the work is to be performed will be closed to the general public during the construction period, however, the Contractor will be required to provide appropriate measures to prevent creation of hazards to the public or interference by the public to the public to the work.

b. Traffic control shall be provided at all times when construction activities impact public streets. Traffic control shall be coordinated with the City of Pittsburgh. Traffic control shall be in accordance with EM 385-1-1.

c. Planting for wetlands and revegetation shall performed at the appropriate time of year to ensure satisfactory growth. The Contractor shall be responsible for maintenance and replacements for the plant establishment period that shall consist of two complete growing seasons.

d. Disposal of excess excavated material shall be at the ball field location across Commercial Avenue. Disposal shall be in accordance with the requirements of Nine Mile Run Aquatic Ecosystem Restoration Project - Phase 1A, Joint Permit Application - Pennsylvania Water Obstruction and Encroachment Permit and U.S. Army Corps of Engineers Section 404 Permit (Attachment 9).

e. Disposal of solid wastes, excess clearing debris, and the six inches of topsoil removed from Invasive Species Management areas shall be disposed at a permitted solid waste disposal facility in compliance with Federal, State, and local requirements, and in accordance with Section 01355 ENVIRONMENTAL PROTECTION. A permitted solid waste disposal facility is a landfill or other facility that is properly permitted by the state in which it is located for the disposal of municipal, residual, or construction/demolition waste. The facility shall be permitted to accept the particular material being disposed.

f. Borrow materials shall be obtained only from commercial sources that are properly permitted in accordance with Federal, State and local requirements. Obtaining topsoil, fill and other materials from non-commercial sources will not be permitted.

1.5.2 Special Contract Requirements

a. Government Field Office: The Contractor shall provide a separate office within the Contractor's field office. The office shall be approximately 240 square feet in area and shall contain a desk, chair, and 3-drawer file cabinet. The Government will make arrangements for telephone service for the Government Field Office. The Contractor shall provide all other utilities and janitorial service.

b. Maintenance of Roads and Parking Areas: The Contractor shall be responsible for maintenance and repair of the haul road, paved access road and parking areas during the period of construction. The haul road shall be maintained in a safe and useable condition. Upon completion of the work that requires use of the haul road, the road shall be restored to its original condition by grading and placement and compaction of aggregate surfacing as necessary. Use of the existing paved access road and parking areas shall be restricted to foot traffic and light equipment. Any damage to the parking areas or paved roads caused by the Contractor's operations shall be repaired in the same manner as the existing construction.

c. Cross Sections and Layout: The Contractor is required to furnish additional profile and cross sections as specified in Section 01012 DESIGN AFTER AWARD, paragraph Design Elements. In addition, the Contractor is required to perform cross sections for measurement purposes as specified in Section 01270 MEASUREMENT AND PAYMENT. The cross sections for measurement shall be provided at minimum intervals of 50 feet with additional cross sections as required to accurately determine quantities. The cross sections shall show original ground elevations, proposed cut and fill lines, slopes and computation of payment quantities. For review and approval purposes, the project shall be divided into the following areas:

a. Phase 1B:

1) Falls Ravine, Sta. 0+00A to Sta. 5+08A, Fern Hollow Sta. 0+00B to Sta. 16+75b, and Fern Hollow Sta. 0+00C to Sta. 7+00C

2) Nine Mile Run, Sta. 0+00D to Sta. 18+68D
3) Nine Mile Run, Sta. 18+68D to Station 36+99D

b. Phase 2:
1) Nine Mile Run, Sta. E0+00 to Sta. E28+20
2) Nine Mile Run, Sta. E28+20 to Sta. E56.40

The Limits of Disturbance (LOD) and limits of planting areas are not identified by survey data. The Contractor shall locate these limits in the field using the contract drawings and mark them by staking of flagging. The Contractor shall also layout the thalweg of the project and locations of the various features to be constructed. No construction will be permitted in any are until the survey data, layout, and any required additional design has been reviewed and accepted by the Contracting Officer.

1.6 GOVERNMENT-FURNISHED MATERIALS

The Government will furnish the following materials to be incorporated in the construction in Phase 1B. The materials will be delivered and stored at the ballfield location at Commercial Avenue. Any shortage of or damage to the Government-furnished materials shall be promptly reported to the Contracting Officer. The Contractor shall be responsible for all costs of loading, hauling and installing the Government-furnished materials. The Contractor will only be responsible for transporting and placing these materials. The Contractor is cautioned that selective loading and placement may be required for some of these materials to conform to the details shown on the contract drawings.

Material	Quantity	Unit	Remarks
Rock, R-8	3,024	Tons	Rock for Rock Cross Vanes, (DSP13-9.2), Rock Vanes (DSP13-10.2), Rock J-Vanes (DSP13-11.2), Boulder Bank Stabilization (DSP13-15.2), Log Bank anchor rocks (DSP13-16.2 (b)), Log Vane anchor rocks (DSP13-17.2 (b)), Root Wad anchor rocks (DSP13-18.2 (d)),Step-Pool Rock (DSP13-3.2 (a)), Bank Rock (SCP13-14.5 (a)), and anchor rock for wood structures
Riprap, R-7	243	Tons	Riprap (DSP13-12.2(a)), Riprap D50=36" (DSP13-14.2 (b))
Riprap, R-5	38	Tons	Riprap D50=24" ((DSP13-14.2 (b))

1.7 INDEMNIFICATION - LOCAL MUNICIPALITIES AND AUTHORITIES

The Contractor agrees to indemnify, save and hold harmless, and defend the City of Pittsburgh, Borough of Edgewood, Borough of Wilkinsburg, Borough of Swissvale and Pittsburgh Water and Sewer Authority (PWSA), their officers, agents and employees from and against all liens, charges, claims, demands, losses, costs, judgments, liabilities, and damages of every kind and nature whatsoever, including court costs and attorney's fees arising by reason of:

the performance by the Contractor of any work in connection with the project under this contract; any act, error or omission of the Contractor or of an agent, employee or licensee of the Contractor or subcontractor(s) and any breach by the Contractor of any of the terms, conditions or provisions of their contract with the Corps for the project under this contract.

1.8 INSURANCE COVERAGE - LOCAL MUNICIPALITIES AND AUTHORITIES

The Contractor shall carry insurance coverage for general liability and workers compensation and to list the City of Pittsburgh, Borough of Edgewood, Borough of Wilkinsburg, Borough of Swissvale and Pittsburgh Water and Sewer Authority (PWSA) as additional insureds as to general liability.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01100

GENERAL REQUIREMENTS

-- End of Section Table of Contents --

SECTION 01100

GENERAL REQUIREMENTS

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

This section covers general requirements applicable to the performance of the work under this contract. These requirements are in addition to those specified in other sections of the contract.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ATTACHMENTS (Attachment)

Attachment 6b	Permits Phase (60% Final) Plans

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals

As-Built Drawings

Record as-built drawings of the completed construction shall be submitted in accordance with the requirements of paragraph "RECORD AS-BUILT DRAWINGS".

1.4 DRAWINGS

1.4.1 Contract Drawings

The Contract Drawings (Attachment 6b) reflect the gerneral requirements for the work to be performed under this contract. In accordance with Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph "CONTRACT DRAWINGS, MAPS, AND SPECIFICATIONS", the Contractor shall check all drawings immediately upon receipt, and verify the figures, dimensions, and the representation of the work, and shall promptly notify the Contracting Officer of any discrepancies. Any omissions from the drawings or misdescription of details of the work which are manifestly necessary to carry out the intent of the drawings, or which are customarily performed, shall not relieve the Contractor from performing such omitted or misdescribed details of work.

1.5 WORK AREAS AND RESTRICTIONS

1.5.1 WORK AREAS

The limits of the Contractor's work areas are as shown on the Contract Drawings. Prior to beginning any construction, the Contractor shall videotape on VHS format all existing structures including, but not limited to, local roads, municipal and private property, and any other areas as directed by the Contracting Officer. If the Contractor proposes to haul materials or equipment by road to the work site, such hauling shall be in accordance with all permits, bonds and other requirements of the Pennsylvania Department of Transportation and local authorities as applicable. No heavy hauling on public roads will be permitted until all permits and bonds have been obtained as required. The Contractor shall be responsible for investigating the load limits for local roads. All damage to transportation facilities, public or private property, or utilities caused by the Contractor's operations shall be repaired to the satisfaction of the Contracting Officer at no additional cost to the Government. The Contractor's use of public roads shown on the drawings shall be in accordance with all permits, bonds and other requirements of the Commonwealth of Pennsylvania Department of Transportation, and all regulations, laws and ordinances of Allegheny County, PA. Dirt, mud and other materials and debris shall be removed, as necessary or as determined by the Contracting Officer, to prevent creation of a dust nuisance or safety hazard. Upon completion of all work requiring use of the local roads, the roadways shall be restored to their preconstruction condition by cleaning and or reconstruction of damaged drainage facilities, base courses, and pavements as necessary. Repairs shall be made in the same manner as the original construction. No separate payment will be made for maintaining and restoring the condition of the roads, and all costs in connection therewith shall be considered as incidental to performance of the work.

1.5.2 Other Contractors

The Contractor is alerted to the fact that other contractors may be employed by the Government or the City of Pittsburgh at the site.

1.5.3 Work and Storage Areas

Work areas at the site will be limited to the areas shown on the drawings. No other areas will be made available at the project for storage of equipment and materials.

1.5.4 Public Use

The Contractor's attention is directed to the fact that the work to be performed is located in a public park. The area has been closed by the City of Pittsburgh; however, the public may still access the area. The Contractor shall address in his Safety Plan his proposed measures for ensuring safety on the project.

1.5.5 Utilities

The Government will not make any utilities available to the Contractor.

1.6 WORK TO BE DONE BY OTHER AGENCIES

Utilities and structures within the area of the permanent work that require relocation or removal by the local interests will be removed, relocated, or adjusted to the extent indicated on the drawings or, if not indicated, to the minimum extent required to adapt the supporting structures to the

permanent work. Any adjustment of a utility which the Contractor may require for his own convenience will be arranged for by the Contractor with the owning agency and all costs in connection therewith shall be borne by him. Overhead utilities to be relocated by others will be constructed with standard clearances. Any increased clearances that the Contractor may require to accommodate equipment he proposed to employ on the work shall be arranged by him at his expense and all costs involved to provide such clearances in excess of standard clearances, including restoration costs, shall be borne by the Contractor.

1.7 DAMAGE TO WORK

The responsibility for damage to any part of the permanent work shall be as set forth in Section 00700 CONTRACT CLAUSES, paragraph "PERMITS AND RESPONSIBILITIES". However, if, in the judgement of the Contracting Officer, any part of the permanent work performed by the Contractor is damaged by flood (greater than design flow) or earthquake, which damage is not due to the failure of the Contractor to take reasonable precautions or to exercise sound engineering and construction practices in the conduct of the work, the Contractor shall make the repairs as ordered by the Contracting Officer and full compensation for such repairs will be made at the applicable contract unit or lump sum prices as fixed and established in the contract. If, in the opinion of the Contracting Officer, there are no contract unit or lump sum prices applicable to any part of such work, an equitable adjustment pursuant to the Section 00700 CONTRACT CLAUSES, paragraph "CHANGES", will be made as full compensation for the repairs of that part of the permanent work for which there are no applicable contract unit or lump sum prices. Except as herein provided, damage to all work (including temporary construction), utilities, materials, equipment and plant shall be repaired to the satisfaction of the Contracting Officer at the Contractor's expense, regardless of the cause of such damage.

1.8 PROTECTION OF UTILITIES

Notwithstanding the Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph "PROTECTION OF UTILITIES", and Section 00700 CONTRACT CLAUSES, paragraph "PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS", the Contractor shall locate and clearly identify all underground and above ground utility lines, wires, cables, pipes, poles, support lines, and culverts, within the Contractor's work area. The Contractor shall contact the Pennsylvania One Call System at telephone (800) 242-1776 at least three days prior to beginning any Construction activity and comply with all applicable provisions of the PA Underground Utility Line Protection Act, PA Act 287. The Contractor shall be responsible for any costs for the Pennsylvania One Call System. The Contractor shall conduct his operations such that the utilities are not damaged or disturbed. Any damage to utilities caused by the Contractor's actions shall be repaired by him at no additional expense to the Government. The Contractor shall store materials and equipment in a manner that does not interfere with utility company services or utility company access to the facilities. The Contractor shall relocate any equipment or stockpiles, at no additional cost to the Government, that interfere with utility company operations, emergency repairs, or standard maintenance services.

1.9 INSPECTIONS AND ACCEPTANCE OF WORK

Not withstanding other provisions of this contract, all materials and work to be performed under this contract shall be inspected and accepted by the

Contracting Officer or his authorized representative(s). Inspections and acceptance will be performed on phases of the work, before the next definable sequential phase of work commences, OR may be performed at the completion of all of the work, as determined appropriate by the Contracting Officer. The Contracting Officer or his authorized representative shall be the individual(s) solely authorized to reject materials, disapprove or approve any work in progress, or order or direct any revision or change to the plans and specifications as presently shown and stated.

PART 2 PRODUCTS

2.1 PRODUCTS AND PARTS OF STANDARD MANUFACTURE

All materials, supplies and articles furnished so as to be incorporated into the work under this contract shall, whenever so specified and otherwise practicable, be standard products of recognized reputable manufacturers. Standard products of manufacturers other than those specified will be accepted when it is proven to the satisfaction of the Contracting Officer, in accordance with the Section 00700 CONTRACT CLAUSES, paragraph "MATERIAL AND WORKMANSHIP", that they are equal in performance, strength, durability, usefulness and convenience for the purpose intended. Any changes required in the details and dimensions shown on the drawings as a result of the substitution of standard products, other than those provided for, shall be properly made as approved by the Contracting Officer, and at the expense of the Contractor. All products specified by "similar or equal to" a particular brand name are for descriptive purposes only and are not to imply that the product is available from only that source.

PART 3 EXECUTION

3.1 SEQUENCE OF WORK

The work shall be prosecuted in such order of precedence as best suits the Contractor's construction schedule and the following restrictions. The Contractor shall perform the work in a diligent, effective manner, and shall schedule his operations in such a manner that the work is completed on time. In accordance with contained in Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph "LIQUIDATED DAMAGES --CONSTRUCTION", the Contractor will be assessed the daily monetary damages for failure to complete the work in the allotted contract period.

3.2 RECORD "AS-BUILT" DRAWINGS

3.2.1 General

The Contractor shall maintain a separate set of marked-up full scale contract drawings (furnished by the Contracting Officer) indicating as-built conditions. These drawings shall be maintained in a current condition at all times until completion of the work and shall be available for review by Government personnel at all times. All variation from the contract drawings, for whatever reason, including those occasioned by modifications, optional materials, and approved shop drawings, shall be indicated. These variations shall be shown in the same general detail utilized in the contract drawings. The following items shall be included as applicable:

a. All underground utilities shall be located both vertically and horizontally and shall be referenced to permanent above-ground features

at each turning point.

b. All modifications to the contract shall be reflected on the as-built drawings at the time of completion of the change order work.

c. Additional profiles and cross sections as specified in Section 01012 DESIGN AFTER AWARD, paragraph Design Elements. The constructed location of the various features of the project shall be shown on as-built drawings.

3.2.2 Submission

Upon completion of the project and before final payment is made, these annotated "As-Built" prints shall be certified as to their correctness by the signature of the Contractor and delivered to the Contracting Officer.

3.3 PRECONSTRUCTION SURVEY

Notwithstanding other Contract Clauses or Special Contract Requirements, the Contractor shall not begin construction until he has thoroughly documented the conditions at the site prior to construction. Documentation shall include, but not be limited to photographs taken prior to construction, as required in Section 01380 PROGRESS PHOTOGRAPHS, and VHS format videotape which clearly shows the condition of the site prior to construction. Particular photographic detail shall be directed to the condition of existing Municipal and private property which are adjacent to the proposed work. All videotapes shall be labeled to clearly identify the location and date at which the videotape was made. No separate payment will be made for videotaping, and all costs in connection therewith shall be considered as a subsidiary obligation of the Contractor.

3.4 TESTING

Where testing is specified herein to be performed by the Government, the Government will perform the testing or will have the testing performed at a commercial laboratory at the expense of the Government. Where items or additional samples from items which have been previously tested and approved at the expense of the Government are required to be retested, the Government will bear the costs of such retesting. Where retesting is required because of the failure of previously tested samples, the expenses of all such retesting shall be borne by the Contractor at no extra expense to the Government. The Contractor shall pay for all additional retesting required due to subsequent test failures. Where so required for original testing, retesting will be performed either in the Government laboratories or at such commercial laboratories as may be approved by the Contracting Officer.

3.5 RECORDS AND REPORTS

All records, test reports and similar documentation produced in connection with quality control operations shall be promptly submitted to the Contracting Officer or his authorized representative as required by the specifications.

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01270

MEASUREMENT AND PAYMENT

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SECTION 01270

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ATTACHMENTS (Attachment)

Attachment 6a	Permits Phase (60% Final) Specifications
Attachment 6b	Permits Phase (60% Final) Plans
Attachment 15	Future Ball Field Site for the City of Pittsburgh

1.2 LUMP SUM PAYMENT ITEMS

Payment items for the work of this contract for which contract lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.2.1 Mobilization and Demobilization

1.2.1.1 Payment

This work is specified in Section 00800 SPECIAL CONTRACT REQUIREMENTS. Payment will be made for costs associated with mobilization and demobilization, as defined in Section 00800 SPECIAL CONTRACT REQUIREMENTS, paragraph "PAYMENT FOR MOBILIZATION AND DEMOBILIZATION."

1.2.1.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.1.3 Payment Item

0009 MOBILIZATION.

1.2.2 New Pipe Culverts

1.2.2.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL)

SPECIFICATIONS, Section 601 PIPE CULVERTS. Payment will be made for costs associated with furnishing and installing the culverts. Payment shall include all materials, labor, equipment, tools, and incidentals necessary to complete the work.

1.2.2.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.2.3 Payment Items

0010 36" REINFORCED CONCRETE PIPE CULVERT.
0045 15" CULVERT, FERN HOLLOW.

1.2.3 Catch Basin Removal

1.2.3.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-26 CATCH BASIN REMOVAL. Payment will be made for costs associated with removal and disposal of the catch basin identified on the drawings to be removed.

1.2.3.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.3.3 Payment Item

0028 CATCH BASIN REMOVAL

1.2.4 Plugging Falls Ravine Culvert

1.2.4.1 Payment

This work is shown on Attachment 6b PERMITS PHASE (60% FINAL) PLANS, Section 1018 REMOVAL OF EXISTING BRIDGES AND CULVERTS. Payment will be made for costs associated with removal and disposal as required and plugging of the existing Falls Ravine culvert.

1.2.4.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.4.3 Payment Items

0044 PLUGGING FALLS RAVINE CULVERT.

1.2.5 Pump Around

1.2.5.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-27 PUMP AROUND. Payment will be made for costs associated with Pump Around - Maintenance of Stream Flow. The payment will be full compensation for installing and maintaining stream flow. Payment shall include sand bags, sheeting, stream pump around, and any other materials, labor, equipment, tools, and incidentals necessary to complete the work.

1.2.5.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.5.3 Payment Items

0029 PUMP AROUND.
0056 PUMP AROUND.

1.2.6 Erosion and Sediment Control

1.2.6.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 104 SCOPE OF WORK. Payment will be made for costs associated with erosion and sediment control during the construction period. The payment will be full compensation for installing and maintaining erosion and sediment control features as shown on the contract drawings and described in the attached permits, including temporary stone fords and other items erosion and sediment control items for which no separate payment is specified. Payment shall include all materials, labor, equipment, tools, and incidentals necessary to complete the work.

1.2.6.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.6.3 Payment Items

0043 EROSION AND SEDIMENT CONTROL.
0078 EROSION AND SEDIMENT CONTROL.

1.2.7 Timber Bridge Removal

1.2.7.1 Payment

This work is shown on Attachment 6b PERMITS PHASE (60% FINAL) PLANS, Section 1018 REMOVAL OF EXISTING BRIDGES AND CULVERTS. Payment will be made for costs associated with removal and disposal of the timber bridge at Sta. E32+65.

1.2.7.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.7.3 Payment Item

0079 TIMBER BRIDGE REMOVAL.

1.2.8 Design Effort

1.2.8.1 Payment

This work is specified in Section 01012 DESIGN AFTER AWARD. Payment will be made for costs associated with design efforts for completion of the design from that shown in Attachment 6a and Attachment 6b. Payment for design effort associated with construction of hte Ball Field Area will be included in the lump sum contract price for Item 0090 CONSTRUCT BALL FIELD

AREA.

1.2.8.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.8.3 Payment Items

0046 DESIGN EFFORT.
0082 DESIGN EFFORT.

1.2.9 Construction Survey

1.2.9.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 686 CONSTRUCTION SURVEYS. Payment will be made for costs associated with performing the construction surveys as specified.

1.2.9.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.9.3 Payment Items

0047 CONSTRUCTION SURVEY.
0083 CONSTRUCTION SURVEY.

1.2.10 Removal Of Sewer Lines

1.2.10.1 Payment

This work is shown on Attachment 6b PERMITS PHASE (60% FINAL) PLANS, Section DSP13-33 REMOVAL AND ABANDONMENT OF EXISTING SEWER LINES. Payment will be made for costs associated with removal, plugging and disposal of the existing abandoned sewer lines at Sta. E 8+65 and E32+50.

1.2.10.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.10.3 Payment Items

0080 REMOVAL OF SEWER LINE, STA E8+65.
0081 REMOVAL OF SEWER LINE, STA E32+50.

1.2.11 Construct Ball Field Area

1.2.11.1 Payment

This work is specified in ~~Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, DSP13-[ ]~~Attachment 15 Future Ball Field Site for thee city of Pittsburgh. Payment will be made for costs associated with grading, installation of drainage system, seeding and mulching the ballfield area. Payment shall include all materials, labor, equipment, tools, and incidentals necessary to complete the work. Payment shall also include design costs associated with construction of the ball field.

1.2.11.2 Unit of Measure

Unit of measure: lump sum (LS).

1.2.11.3 Payment Item

0090 CONSTRUCT BALL FIELD AREA.

1.3 UNIT PRICE PAYMENT ITEMS

Payment items for the work of this contract on which the contract unit price payments will be made are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, environmental protection, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.3.1 Progress Photographs

1.3.1.1 Payment

This work is specified in Section 01380 PROGRESS PHOTOGRAPHS. Payment will be made for costs associated with taking, processing, labeling, and delivering the prints and slides.

1.3.1.2 Measurement

Measurement will be made of the number of sets of photographs taken and delivered to the Contracting Officer as approved or directed by the Contracting Officer. Each set shall consist of all specified prints and slides for each photographic session as specified.

1.3.1.3 Unit of Measure

Unit of measure: Set (SE).

1.3.1.4 Payment Item

0002 PROGRESS PHOTOGRAPHS (SETS OF 10).

1.3.2 Stabilized Construction Entrance

1.3.2.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 104 SCOPE OF WORK. This price shall include all costs in connection with constructing, maintaining, and removing the stabilized construction entrances.

1.3.2.2 Measurement

Rock construction entrance will be measured for payment by the number of stabilized construction entrances actually built.

1.3.2.3 Unit of Measure

Unit of measure: Each (EA)

1.3.2.4 Payment Items

0003 STABILIZED CONSTRUCTION ENTRANCE.
0049 STABILIZED CONSTRUCTION ENTRANCE.

1.3.3 Clearing and Grubbing (Including Tree Removal)

1.3.3.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 201 CLEARING AND GRUBBING. Payment will be made for costs associated with clearing and grubbing and removal of all debris within the Limits of Disturbance in the areas shown on the Contract Drawings and as specified. The price shall include removal of all brush, trees and debris within the limits indicated and disposal of removed materials. No payment will be made for clearing outside the limits specified or shown on the drawings unless otherwise directed by the Contracting Officer.

1.3.3.2 Measurement

Measurement will be made by the square yard of area cleared within the limits specified, shown on the drawing, or as directed by the Contracting Officer. Areas will be based on horizontal measurement, not along the slope. No measurement will be made of clearing outside the limits shown on the drawings unless otherwise directed by the Contracting Officer. Measurement will be based on the area acceptably cleared upon final acceptance of the work.

1.3.3.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.3.4 Payment Items

0004 CLEARING AND GRUBBING (INCLUDING TREE REMOVAL).
0050 CLEARING AND GRUBBING (INCLUDING TREE REMOVAL).

1.3.4 Excavation

1.3.4.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 204 CLASS 2, CLASS 3, AND CLASS 4 EXCAVATION, Section 205 BORROW EXCAVATION, Section 206 EMBANKMENT, Section 801 STOCKPILING TOPSOIL, and Section 802 TOPSOIL FURNISHED AND PLACED. Payment will be made for costs associated with excavation, which includes performing required excavation and other operations incidental thereto, and placement or stockpiling of suitable excavated material, or disposition of unsuitable and frozen materials.

1.3.4.2 Measurement

The total quantity of excavated material for which payment will be made will be the theoretical quantity between the ground surface as determined by a survey and the grade and slope of the theoretical cross sections indicated. Cross sections shall be performed at maximum intervals of 50 feet and at additional locations as required to accurately determine

accurate quantities. Original and final cross sections shall be performed at the same locations.No allowance will be made for overdepth excavation or for the removal of any material outside the required slope lines unless authorized.

1.3.4.3 Unit of Measure

Unit of measure: cubic yard (CD).

1.3.4.4 Payment Items

0005 BORROW EXCAVATION (CUT AND FILL BALANCE). This item includes material that is excavated and placed in embankments or fills within Phase 1B of the project.

0006 BORROW EXCAVATION (IMPORTED). This item includes material that is obtained from offsite and placed in embankments and fills in Phase 1B of the project.

0007 BORROW EXCAVATION (EXTENSIVE INVASIVE CONTROL SOIL REMOVED OFF-SITE). This item includes material excavated from indicated invasive species control areas within Phase 1B of the project and disposed of at a commercial disposal facility.

0008 BORROW EXCAVATION (STOCKPILING TOPSOIL). This item includes excavating within Phase 1B of the projectand stockpiling topsoil for reuse on the project.

0051 CLASS 2, CLASS 3, CLASS 4 EXCAVATION. This item includes excavation in the channel in Phase 2 of the project.

0052 BORROW EXCAVATION. This item includes materials obtained from offsite and placed in embankments and fills in Phase 2 of the project.

0053 STOCKPILING TOPSOIL. This item includes excavating and stockpiling topsoil for reuse within Phase 2 of the project.

0054 TOPSOIL FURNISHED AND PLACED, EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95). This item includes material obtained from offsite and placed in Phase 2 of the project. It does not include topsoil placed on the sewer protection that is identified as an awardable option item.

0085 TOPSOIL FURNISHED AND PLACED AT SEWER PROTECTION PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95). This item includes material obtained from offsite and placed on the sewer protection in Phase 2 of the project that is identified as an awardable option item.

1.3.5 Water Course and Slope Erosion Protection

1.3.5.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section 806 WATER COURSE AND SLOPE EROSION PROTECTION. Payment will be made for costs associated with furnishing and placing biodegradable erosion control blanket in the areas shown on the Contract Drawings and as specified.

1.3.5.2 Measurement

Measurement will be made by the square yard of erosion control blanket placed within the limits specified, shown on the drawing, or as directed by the Contracting Officer. Areas will be based on horizontal measurement, not along the slope.

1.3.5.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.5.4 Payment Items

0011 SLOPE EROSION PROTECTION.
0055 WATER COURSE AND SLOPE EROSION PROTECTION EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95).
0087 WATER COURSE AND SLOPE EROSION PROTECTION AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95).

1.3.6 Bituminous Removal and Disposal

1.3.6.1 Payment

This work is shown on Attachment 6b PERMITS PHASE (60% FINAL) PLANS, Sheets 30 and 31. Payment will be made for costs associated with removal of bituminous pavement in the areas shown on the Contract Drawings and as specified. The price shall include removal of all bituminous pavement and base courses within the limits indicated and disposal of removed materials.

1.3.6.2 Measurement

Measurement will be made by the square yard of area of pavement removed within the limits specified, shown on the drawing, or as directed by the Contracting Officer. Areas will be based on horizontal measurement.

1.3.6.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.6.4 Payment Items

0012 BITUMINOUS REMOVAL AND DISPOSAL.

1.3.7 Salvaging and Stockpiling, and Placing Channel Bed Materials

1.3.7.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-1 SALVAGING AND STOCKPILING CHANNEL BED MATERIAL FROM STREAM CHANNEL and Section DSP13-3 INSTALL CHANNEL BED MATERIAL. Payment will be made for costs associated with salvaging, stockpiling, and placing channel bed material, which includes performing required excavation and other operations incidental thereto, stockpiling of suitable channel bed material, and placing suitable material or disposition of unsuitable materials.

1.3.7.2 Measurement

The total quantity of excavated material for which payment will be made will be the theoretical quantity between the ground surface as determined

by a survey and the grade and slope of the theoretical cross sections indicated. No allowance will be made for overdepth excavation or for the removal of any material outside the required slope lines unless authorized.

1.3.7.3 Unit of Measure

Unit of measure: cubic yard (CD).

1.3.7.4 Payment Item

0013 SALVAGING, STOCKPILING AND PLACING CHANNEL BED MATERIALS.

1.3.8 Salvaging, Stockpiling And Placing Vegetative Materials

1.3.8.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-4 SALVAGING AND STOCKPILING BRUSH PILES, Section DSP13-5 SALVAGING AND STOCKPILING WOOD SNAGS, and Section DSP13-6 SALVAGING AND STOCKPILING DOWNED LOGS. Payment will be made for costs associated with salvaging and stockpiling brush, trees and logs, and constructing brush piles, wood snags, or downed logs as shown on the drawings and as specified.

1.3.8.2 Measurement

Measurement will be made of the number of brush piles, wood snags, or downed logs constructed.

1.3.8.3 Unit of Measure

Unit of measure: each (EA).

1.3.8.4 Payment Items

0014 BRUSH PILES (SALVAGE, STOCKPILE, AND PLACE).
0015 WOOD SNAGS (SALVAGE, STOCKPILE, AND PLACE).
0016 DOWNED LOGS (SALVAGE, STOCKPILE AND PLACE).
0066 BRUSH PILES (SALVAGE, STOCKPILE, AND PLACE).
0067 WOOD SNAGS (SALVAGE, STOCKPILE, AND PLACE).
0068 DOWNED LOGS (SALVAGE, STOCKPILE AND PLACE).

1.3.9 Bituminous Sawcut

1.3.9.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-7 BITUMINOUS CONCRETE SAW-CUT. Payment will be made for costs associated with sawcutting existing bituminous pavement at the locations indicated on the drawings and as specified.

1.3.9.2 Measurement

~~Handrailing~~Bituminous sawcut will be measured for payment based upon the number of linear feet of bituminous sawcutting as shown on the drawings.

1.3.9.3 Unit of Measure

Unit of measure: linear foot (LF).

1.3.9.4 Payment Item

0017 BITUMINOUS SAWCUT.

1.3.10 Construct Stream Channel Features

1.3.10.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-9 ROCK CROSS VANES, Section DSP13-10 ROCK VANE, Section DSP13-11 ROCK J-VANES, Section DSP13-12 ROCK SPILLWAY WITH LIVE BRANCH LAYERING, Section DSP13-13 STEP POOL, Section DSP13-14 PLUNGE POOL, Section DSP13-14 BOULDER BANK STABILIZATION and Section DSP13-33 - BOULDER BANK STABILIZATION ALONG SEEP WALL. Payment will be made for costs associated with excavation and backfilling, transporting Government-furnished rock (Phase 1B), furnishing rock (Phase 2), salvaging materials from within the project limits, furnishing all other materials as required for the various features, , and constructing the various rock stream channel features as shown on the drawings and as specified.

1.3.10.2 Measurement

Rock stream channel features will be measured for payment by the volume of rock, length of steps or number of features as indicated on the price schedule. Where indicated to be measured by volume, ~~cubic yard of individual rocks by determining~~ the nominal volume of each rock placed will be determined to the nearest 0.1 cubic yard. The rock will be measured for payment before being placed in the work. The rock shall be measured in the presence of the Government representative. Where measurement is indicated to be measured by length, measurement will be based upon the number of linear feet of such feature constructed as specified. Measurement will be made horizontally along the bank. Where measurement is indicated to be "Each", the features will be measured for payment by the number of such features actually constructed.

1.3.10.3 Unit of Measure

Unit of measure: cubic yard (CD) or each (EA), as indicated.

1.3.10.4 Payment Items

0018 TRANSPORT ROCK AND CONSTRUCT ROCK CROSS VANES (Each).
0019 TRANSPORT ROCK AND CONSTRUCT ROCK VANES (Each).
0020 TRANSPORT ROCK AND CONSTRUCT ROCK J-VANES (Each).
0021 TRANSPORT ROCK AND CONSTRUCT ROCK SPILLWAY WITH LIVE STAKESCubic Yard.
0022 TRANSPORT ROCK AND CONSTRUCT STEP-POOLS (Cubic Yard).
0023 TRANSPORT ROCK AND CONSTRUCT PLUNGE POOL (Cubic yard).
0024 TRANSPORT ROCK AND CONSTRUCT BOULDER BANK STABILIZATION (Cubic Yard).
0060 CONSTRUCT ROCK CROSS VANES (Each).
0061 CONSTRUCT ROCK J-VANES (Each).
0062 CONSTRUCT BOULDER CLUSTER AND RANDOM BOULDER (Cubic Yard).
0063 CONSTRUCT BOULDER BANK STABILIZATION, EXCEPT AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95) (Cubic Yard). This item does not include boulder bank protection at the sewer protection that is identified as an awardable option item.
0064 CONSTRUCT BOULDER STEPS WITH LIVE BRANCH BUNDLES (Linear Feet).
0086 CONSTRUCT BOULDER BANK STABILIZATION AT SEWER PROTECTION (STA. E19+70 TO STA. E 21+70 AND STA. E22+70 TO STA. E24+95) (Cubic Yard). This item

includes boulder bank protection at the sewer protection that is identified as an awardable option item.

1.3.11 Log Bank Protection

1.3.11.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-16 LOG BANK PROTECTION. Payment will be made for costs associated with constructing log bank protection at the locations indicated on the drawings and as specified.

1.3.11.2 Measurement

~~Handrailing~~Log bank protection will be measured for payment based upon the number of linear feet of log bank protection construted as shown on the drawings.

1.3.11.3 Unit of Measure

Unit of measure: linear foot (LF).

1.3.11.4 Payment Item

0025 LOG BANK PROTECTION.

1.3.12 Log Vanes

1.3.12.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-17 LOG VANES. Payment will be made for costs associated with constructing log vanes, including salvaging logs or obtaining logs from offsite, as shown on the drawings and as specified.

1.3.12.2 Measurement

Measurement will be made of the number of log vanes constructed as shown on the drawings.

1.3.12.3 Unit of Measure

Unit of measure: each (EA).

1.3.12.4 Payment Item

0026 LOG VANE.

1.3.13 Root Wad Revetments

1.3.13.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-18 ROOT WAD REVETMENTS. Payment will be made for costs associated with constructing root wad revetments, including harvesting root wads from within the limits of disturbance or obtaining root wads from offsite, as shown on the drawings and as specified.

1.3.13.2 Measurement

Measurement will be made of the number of root wad revetments constructed as shown on the drawings.

1.3.13.3 Unit of Measure

Unit of measure: each (EA).

1.3.13.4 Payment Items

0027 ROOT WAD REVETMENT.
0065 ROOT WAD REVETMENT.

1.3.14 Blaze Orange Fence

1.3.14.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-28 Blaze Orange Fence. Payment will be made for costs associated with furnishing, installing, and removing blaze orange fence at the locations indicated and as specified.

1.3.14.2 Measurement

Blaze orange will be measured for payment based upon the number of linear feet of blaze orange fence installed as specified. Measurement will be made along the top of the fence. No measurement will be made of fence in overlaps.

1.3.14.3 Unit of Measure

Unit of measure: linear foot (LF).

1.3.14.4 Payment Items

0030 BLAZE ORANGE FENCE.
0057 BLAZE ORANGE FENCE.

1.3.15 Planting

1.3.15.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-29 PLANTING TREES, SHRUBS AND HERBACEOUS PLANTS IN ZONES 1 - 14 and Section DSP13-32 NATIVE SEEDING & MULCHING FOR PLANTING ZONES 1 - 14. Payment will be made for costs associated with furnishing and planting the plants in the various areas shown on the Contract Drawings and as specified. The price shall include preparation of planting areas and furnishing and installing all required plant materials, including soil materials, guying materials and mulch. A breakdown of the quantities shown on the drawings for Phase 1B, Phase 2 Basic Features, and Phase 2 Additional Items is presented in the BREAKDOWN OF PLANTING AREAS BY PHASE OF WORK at the end of this section.

1.3.15.2 Measurement

Measurement will be made by the square yard of area planted within the limits of each planting zone shown on the drawings and as specified. Areas will be based on horizontal measurement, not along the slope. Measurement

will be based on the area acceptably planted upon final acceptance of the work.

1.3.15.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.15.4 Payment Items

0031 PLANTING ZONE 1 - PALUSTRINE SCRUB-SHRUB WETLAND.
0032 PLANTING ZONE 2 - PALUSTRINE EMERGENT WETLAND.
0033 PLANTING ZONE 3 - NATIVE MEADOW.
0034 PLANTING ZONE 4 - RIPARIAN WOODLAND.
0035 PLANTING ZONE 5 - MESIC WOODLAND.
0036 PLANTING ZONE 6 - RIPARIAN WOODLAND SUPPLEMENT.
0037 PLANTING ZONE 7 - PALUSTRINE FORESTED WETLAND.
0038 PLANTING ZONE 8 - HUMMOCK WETLAND.
0039 PLANTING ZONE 9 - RIPARIAN SCRUB-SHRUB.
0040 PLANTING ZONE 10 - OXBOW WETLAND - FORESTED.
0041 PLANTING ZONE 11 - SWALE.
0072 PLANTING ZONE 1 - PALUSTRINE SCRUB-SHRUB WETLAND.
0073 PLANTING ZONE 3 - NATIVE MEADOW.
0074 PLANTING ZONE 4 - RIPARIAN WETLAND.
0075AA PLANTING ZONE 5 - MESIC WOODLANDS, WITHIN 11 FEET VERTICALLY OF STREAM THALWEG.
0075BB PLANTING ZONE 6 - RIPARIAN WOODLAND SUPPLEMENT.
0076 PLANTING ZONE 12 - FRESHWATER WETLAND - SCRUB-SHRUB.
0077 PLANTING ZONE 13 - OXBOW WETLAND - EMERGENT.
0088 PLANTING ZONE 6 - REPARIAN WOODLAND SUPPLEMENT.
0089 PLANTING ZONE 14 - ~~RIPARIAN REFORESTATION~~SUPPLEMENT MESIC WOODLANDS
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1.3.16 Live Branch Layering

1.3.16.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-30 LIVE BRANCH LAYERING. Payment will be made for costs associated with furnishing and installinglive branch layering at the locations indicated and as specified.

1.3.16.2 Measurement

Live branch layering will be measured for payment based upon the number of linear feet of live branch layering constructed as specified. Measurement will be made horizontally along the bank.

1.3.16.3 Unit of Measure

Unit of measure: linear foot (LF).

1.3.16.4 Payment Items

0042 LIVE BRANCH LAYERING.
0071 LIVE BRANCH LAYERING.

1.3.17 Enhanced Riffles

1.3.17.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-20 ENHANCED RIFFLES. Payment will be made for costs associated with placement of salvaged channel bed material in the areas shown on the Contract Drawings and as specified.

1.3.17.2 Measurement

Measurement will be made by the square yard of enhanced riffle constructed within the limits shown on the drawings and as specified.

1.3.17.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.17.4 Payment Item

0058 ENHANCED RIFFLES (PHASE A).

1.3.18 Riffle Structure

1.3.18.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-21 RIFFLE STRUCTURES and Section DSP13-34 - RIFFLE STRUCTURE INTERFACE ALONG SEEP WALL. Payment will be made for costs associated with removal existing Belgian block placement of Government-furnished rock and salvaged channel bed material in the areas shown on the Contract Drawings and as specified.

1.3.18.2 Measurement

Measurement will be made by the square yard of riffle structures constructed within the limits shown on the drawings and as specified.

1.3.18.3 Unit of Measure

Unit of measure: square yard (SY).

1.3.18.4 Payment Item

0059 RIFFLE STRUCTURE.

1.3.19 Large Woody Debris Deflectors

1.3.19.1 Payment

This work is specified in Attachment 6a, PERMITS PHASE (60% FINAL) SPECIFICATIONS, Section DSP13-24 LARGE WOODY DEBRIS DEFLECTOR and Section DSP13-25 ROOTWAD WITH LARGE WOODY DEBRIS DEFLECTOR. This price shall include all costs in connection with constructing large woody debris deflectors and rootwads with large woody debris deflectors, including harvesting large woody debris and root wads from within the limits of disturbance or obtaining the materials from offsite, as shown on the drawings and as specified..

1.3.19.2 Measurement

Rock construction entrance will be measured for payment by the number of large woody debris deflectors or root wads with large woody debris deflectors actually built.

1.3.19.3 Unit of Measure

Unit of measure: Each (EA)

1.3.19.4 Payment Items

0069 LARGE WOODY DEBRIS DEFLECTOR.
0070 ROOT WAD WITH LARGE WOODY DEBRIS DEFLECTOR.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

-- End of Section --

PLANT AND COMPOSITION SCHEDULE

2-Planting Zone 1 - PALUSTRINE SCRUB-SHRUB WETLAND

Size (acres): 0.1

Overall Spacing (feet off center)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Spacing (ft.)
8	681			**SHRUBS**					
		15	10	Alnus serrulata	Smooth alder	CON	Random	3 - 4 ft.	21
		10	7	Aronia melanocarpa	Black chokeberry	CON	Random	2 - 3 ft.	25
		10	7	Cephalanthus occidentalis	Buttonbush	CON	Random	3 - 4 ft.	25
		10	7	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	25
		5	3	Cornus sericea	Red-osier dogwood	CON	Random	2 - 3 ft.	38
		10	7	Ilex verticillata	Winterberry	CON	Random	3 - 4 ft.	25
		10	7	Physocarpus opulifolius	Ninebark	CON	Random	3 - 4 ft.	25
		10	7	Spirea tomentosa	Steeple-bush	CON	Random	2 - 3 ft.	25
		20	14	Viburnum recognitum	Northern arrowwood	CON	Random	3 - 4 ft.	18
		100	**69**	**= total**					
4	2723			**HERBACEOUS PLANTS**					
		15	41	Asclepias incarnata	Swamp milkweed	CON	Random	2" plug	10
		15	41	Carex crinita	Fringed sedge	CON	Random	2" plug	10
		20	54	Juncus effusus	Softrush	CON	Random	2" plug	9
		15	41	Lobelia cardinalis	Cardinal flower	CON	Random	2" plug	10
		20	54	Rudbeckia laciniata	Tall coneflower	CON	Random	2" plug	9
		15	41	Scirpus pungens	Three square	CON	Random	2" plug	10
		100	**272**	**= total**					
N/A	50			**NATIVE SEED**					
		10	0.5	Andropogon gerardii	Big bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	0.1	Calamagrostis canadensis	Canada bluejoint	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	1	Carex vulpinoidea	Fox sedge	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	1.3	Elymus virginicus	Virginia wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	1	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	1	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		4	0.2	Verbena hastata	Blue vervain	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**5.1**						

LEGEND

CON= container

P.L.S.= Pure Live Seed

PLANT AND COMPOSITION SCHEDULE

1B-Planting Zone 1 - PALUSTRINE SCRUB-SHRUB WETLAND — Size (acres): 0.47

Overall Spacing (feet off center)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Spacing (ft.)
8	681			**SHRUBS**					
		15	48	Alnus serrulata	Smooth alder	CON	Random	3 - 4 ft.	10
		10	32	Aronia melanocarpa	Black chokeberry	CON	Random	2 - 3 ft.	12
		10	32	Cephalanthus occidentalis	Buttonbush	CON	Random	3 - 4 ft.	12
		10	32	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	12
		5	16	Cornus sericea	Red-osier dogwood	CON	Random	2 - 3 ft.	17
		10	32	Ilex verticillata	Winterberry	CON	Random	3 - 4 ft.	12
		10	32	Physocarpus opulifolius	Ninebark	CON	Random	3 - 4 ft.	12
		10	32	Spirea tomentosa	Steeple-bush	CON	Random	2 - 3 ft.	12
		20	64	Viburnum recognitum	Northern arrowwood	CON	Random	3 - 4 ft.	8
		100	**320**	**= total**					
4	2723			**HERBACEOUS PLANTS**					
		15	192	Asclepias incarnata	Swamp milkweed	CON	Random	2" plug	5
		15	192	Carex crinita	Fringed sedge	CON	Random	2" plug	5
		20	256	Juncus effusus	Softrush	CON	Random	2" plug	4
		15	192	Lobelia cardinalis	Cardinal flower	CON	Random	2" plug	5
		20	256	Rudbeckia laciniata	Tall coneflower	CON	Random	2" plug	4
		15	192	Scirpus pungens	Three square	CON	Random	2" plug	5
		100	**1280**	**= total**					
N/A	50			**NATIVE SEED**					
		10	2.4	Andropogon gerardii	Big bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	0.2	Calamagrostis canadensis	Canada bluejoint	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	4.7	Carex vulpinoidea	Fox sedge	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	5.9	Elymus virginicus	Virginia wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	4.7	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	4.7	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		4	0.9	Verbena hastata	Blue vervain	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**23.5**						

LEGEND

CON= container

P.L.S.= Pure Live Seed

PLANT COMPOSITION SCHEDULE									
2-Planting Zone 3 - NATIVE MEADOW							**Size (acres):**		**0.27**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
N/A	30			**NATIVE SEED**					
		15	1.2	Andropogon gerardii	Big bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.2	Aquilegia canadensis	Eastern columbine	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	0.1	Asclepias tuberosa	Butterfly milkweed	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.2	Aster pilosus	Heath aster	LB of P.L.S. 76 %	SEED	N/A	N/A
		3	0.2	Liatris spicata	Blazingstar	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	1.6	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.2	Monarda fistulosa	Wild bergamot	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	1.2	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.2	Penstemon digitalis	Smooth penstemon	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	0.4	Rudbeckia hirta	Black-eyed Susan	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	1.2	Schizachyrium scoparium	Little bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		3	0.2	Solidago canadensis	Canada goldenrod	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	1.2	Sorghastrum nutans	Indiangrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**8.1**	**=total**					
LEGEND									
P.L.S.=Pure Live Seed									

PLANT COMPOSITION SCHEDULE									
1B-Planting Zone 3 - NATIVE MEADOW							**Size (acres):**		**0.54**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
N/A	30			**NATIVE SEED**					
		15	2.4	Andropogon gerardii	Big bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.3	Aquilegia canadensis	Eastern columbine	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	0.2	Asclepias tuberosa	Butterfly milkweed	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.3	Aster pilosus	Heath aster	LB of P.L.S. 76 %	SEED	N/A	N/A
		3	0.5	Liatris spicata	Blazingstar	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	3.2	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.3	Monarda fistulosa	Wild bergamot	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	2.4	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.3	Penstemon digitalis	Smooth penstemon	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	0.8	Rudbeckia hirta	Black-eyed Susan	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	2.4	Schizachyrium scoparium	Little bluestem	LB of P.L.S. 76 %	SEED	N/A	N/A
		3	0.5	Solidago canadensis	Canada goldenrod	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	2.4	Sorghastrum nutans	Indiangrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**16**	**=total**					
LEGEND									
P.L.S.=Pure Live Seed									

Plant and Composition Schedule									
2-Planting Zone 4 - RIPARIAN WOODLAND							**Size (acres):**		**2.41**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
13	258			**TREES**					
		15	93	Acer saccharinum	Silver maple	CON	Random	3 - 4 ft.	34
		10	62	Celtis occidentalis	Hackberry	CON	Random	3 - 4 ft.	41
		20	124	Fraxinus pennsylvanica	Green ash	CON	Random	3 - 4 ft.	29
		15	93	Nyssa sylvatica	Black gum	CON	Random	4 - 5 ft.	34
		20	124	Platanus occidentalis	American sycamore	CON	Random	4 - 5 ft.	29
		15	93	Quercus palustris	Pin oak	CON	Random	5 - 6 ft.	34
		5	31	Salix nigra	Black willow	CON	Random	3 - 4 ft.	58
		100	**620**	**= total**					
15	194			**MIDSTORY TREES**					
		15	70	Acer negundo	Boxelder	CON	Random	2 - 3 ft.	39
		20	94	Alnus serrulata	Smooth alder	CON	Random	3 - 4 ft.	33
		20	94	Amelanchier arborea	Downy serviceberry	CON	Random	3 - 4 ft.	33
		20	94	Betula nigra	River birch	CON	Random	4 - 5 ft.	33
		25	117	Carpinus caroliniana	American hornbeam	CON	Random	4 - 5 ft.	30
		100	**469**	**= total**					
14	222			**SHRUBS**					
		20	107	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	31
		15	80	Lindera benzoin	Common spicebush	CON	Random	2 - 3 ft.	36
		15	80	Physocarpus opulifolius	Common nineback	CON	Random	3 - 4 ft.	36
		15	80	Sambucus canadensis	American elder	CON	Random	2 - 3 ft.	36
		15	80	Vaccinium corymbosum	Highbush blueberry	CON	Random	2 - 3 ft.	36
		20	107	Viburnum recognitum	Northern arrowwood	CON	Random	2 - 3 ft.	31
		100	**534**	**= total**					
N/A	40			**NATIVE SEED**					
		1	1	Calamagrostis canadensis	Canada bluejoint	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	24.1	Dichanthelium clandestinum	Deertongue grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	24.1	Elymus virginicus	Virginia wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	1.9	Eupatorium fistulosum	Joe-pye weed	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	19.3	Lolium multiflorum	Annual rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	24.1	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	1	Rudbeckia laciniata	Tall coneflower	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	1	Vernonia novaboracensis	New York ironweed	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	96.4						
CON=container									

Plant and Composition Schedule									
1B-Planting Zone 4 - RIPARIAN WOODLAND							**Size (acres):**		**9.61**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
13	258			**TREES**					
		15	372	Acer saccharinum	Silver maple	CON	Random	3 - 4 ft.	17
		10	248	Celtis occidentalis	Hackberry	CON	Random	3 - 4 ft.	21
		20	496	Fraxinus pennsylvanica	Green ash	CON	Random	3 - 4 ft.	15
		15	372	Nyssa sylvatica	Black gum	CON	Random	4 - 5 ft.	17
		20	496	Platanus occidentalis	American sycamore	CON	Random	4 - 5 ft.	15
		15	372	Quercus palustris	Pin oak	CON	Random	5 - 6 ft.	17
		5	124	Salix nigra	Black willow	CON	Random	3 - 4 ft.	29
		100	**2480**	**= total**					
15	194			**MIDSTORY TREES**					
		15	280	Acer negundo	Boxelder	CON	Random	2 - 3 ft.	19
		20	373	Alnus serrulata	Smooth alder	CON	Random	3 - 4 ft.	17
		20	373	Amelanchier arborea	Downy serviceberry	CON	Random	3 - 4 ft.	17
		20	373	Betula nigra	River birch	CON	Random	4 - 5 ft.	17
		25	466	Carpinus caroliniana	American hornbeam	CON	Random	4 - 5 ft.	15
		100	**1865**	**= total**					
14	222			**SHRUBS**					
		20	427	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	16
		15	320	Lindera benzoin	Common spicebush	CON	Random	2 - 3 ft.	18
		15	320	Physocarpus opulifolius	Common nineback	CON	Random	3 - 4 ft.	18
		15	320	Sambucus canadensis	American elder	CON	Random	2 - 3 ft.	18
		15	320	Vaccinium corymbosum	Highbush blueberry	CON	Random	2 - 3 ft.	18
		20	427	Viburnum recognitum	Northern arrowwood	CON	Random	2 - 3 ft.	16
		100	**2134**	**= total**					
N/A	40			**NATIVE SEED**					
		1	3.8	Calamagrostis canadensis	Canada bluejoint	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	96.1	Dichanthelium clandestinum	Deertongue grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	96.1	Elymus virginicus	Virginia wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	7.7	Eupatorium fistulosum	Joe-pye weed	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	76.9	Lolium multiflorum	Annual rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		25	96.1	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	3.8	Rudbeckia laciniata	Tall coneflower	LB of P.L.S. 76 %	SEED	N/A	N/A
		1	3.8	Vernonia novaboracensis	New York ironweed	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	96.4						
CON=container									

PLANT AND COMPOSITION SCHEDULE

2-Planting Zone 5 - MESIC WOODLAND

Size (acres): 0.18

Overall Spacing (feet off center)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Spacing (ft.)
12	303			**TREES**					
		15	8	Acer rubrum	Red maple	CON	Random	3 - 4 ft.	31
		10	5	Celtis occidentalis	Common hackberry	CON	Random	3 - 4 ft.	40
		15	8	Fraxinus americana	White ash	CON	Random	4 - 5 ft.	31
		15	8	Liriodendron tulipifera	Tulip poplar	CON	Random	3 - 4 ft.	31
		10	5	Pinus strobus	Eastern white pine	B&B	Random	4 - 5 ft.	40
		10	5	Quercus alba	White oak	CON	Random	5 - 6 ft.	40
		15	8	Quercus rubra	Northern red oak	CON	Random	5 - 6 ft.	31
		10	5	Tilia americana	Basswood	CON	Random	4 - 5 ft.	40
		100	**52**	**= total**					
15	194			**UNDERSTORY TREES**					
		15	5	Amelanchier arborea	Shad bush	CON	Random	3 - 4 ft.	40
		15	5	Cercis canadensis	Eastern redbud	CON	Random	3 - 4 ft.	40
		15	5	Cornus florida	Flowering dogwood	CON	Random	3 - 4 ft.	40
		15	5	Ostrya virginiana	American hophornbeam	CON	Random	3 - 4 ft.	40
		15	5	Sassafras albidum	Sassafras	CON	Random	3 - 4 ft.	40
		25	9	Viburnum lentago	Nannyberry	CON	Random	3 - 4 ft.	30
		100	**34**	**= total**					
10	436			**SHRUBS**					
		15	12	Corylus americana	American filbert	CON	Random	3 - 4 ft.	26
		15	12	Hamamelis virginiana	Witch hazel	CON	Random	3 - 4 ft.	26
		15	12	Hydrangea arborescens	Smooth hydrangea	CON	Random	2 - 3 ft.	26
		10	8	Parthenocissus quinquefolia	Virginia creeper	CON	Random	6 - 9 in.	31
		20	16	Vaccinium angustifolium	Lowbush blueberry	CON	Random	1 - 1.5 ft.	22
		25	20	Viburnum acerifolium	Mapleleaf viburnum	CON	Random	2 - 3 ft.	20
		100	**80**	**= total**					
N/A	50			**NATIVE SEED**					
		15	1.4	Andropogon virginicus	Broomsedge	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	2	Dichanthelium clandestinum	Deertongue grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	2	Elymus canadensis	Canada wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	1	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		13	1	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0	Penstemon digitalis	Beardtongue	LB of P.L.S. 76 %	SEED	N/A	N/A
		10	1	Rudbeckia hirta	Black-eyed Susan	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	0	Tridens flavus	Purpletop	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**8.4**	**= total**					

LEGEND

CON= container

P.L.S.= Pure Live Seed

PLANT AND COMPOSITION SCHEDULE

1B-Planting Zone 5 - MESIC WOODLAND

Size (acres): 0.55

Overall Spacing (feet off center)	Quantity per acre	Frequency (%)	Species Quantity	Vegetation Strata/ Species Name	Common Name	Unit	Spacing Type	Size	Individual Spacing (ft.)
12	303			**TREES**					
		15	25	Acer rubrum	Red maple	CON	Random	3 - 4 ft.	18
		10	17	Celtis occidentalis	Common hackberry	CON	Random	3 - 4 ft.	21
		15	25	Fraxinus americana	White ash	CON	Random	4 - 5 ft.	18
		15	25	Liriodendron tulipifera	Tulip poplar	CON	Random	3 - 4 ft.	18
		10	17	Pinus strobus	Eastern white pine	B&B	Random	4 - 5 ft.	21
		10	17	Quercus alba	White oak	CON	Random	5 - 6 ft.	21
		15	25	Quercus rubra	Northern red oak	CON	Random	5 - 6 ft.	18
		10	17	Tilia americana	Basswood	CON	Random	4 - 5 ft.	21
		100	**168**	**= total**					
15	194			**UNDERSTORY TREES**					
		15	16	Amelanchier arborea	Shad bush	CON	Random	3 - 4 ft.	22
		15	16	Cercis canadensis	Eastern redbud	CON	Random	3 - 4 ft.	22
		15	16	Cornus florida	Flowering dogwood	CON	Random	3 - 4 ft.	22
		15	16	Ostrya virginiana	American hophornbeam	CON	Random	3 - 4 ft.	22
		15	16	Sassafras albidum	Sassafras	CON	Random	3 - 4 ft.	22
		25	27	Viburnum lentago	Nannyberry	CON	Random	3 - 4 ft.	17
		100	**107**	**= total**					
10	436			**SHRUBS**					
		15	36	Corylus americana	American filbert	CON	Random	3 - 4 ft.	15
		15	36	Hamamelis virginiana	Witch hazel	CON	Random	3 - 4 ft.	15
		15	36	Hydrangea arborescens	Smooth hydrangea	CON	Random	2 - 3 ft.	15
		10	24	Parthenocissus quinquefolia	Virginia creeper	CON	Random	6 - 9 in.	18
		20	48	Vaccinium angustifolium	Lowbush blueberry	CON	Random	1 - 1.5 ft.	13
		25	60	Viburnum acerifolium	Mapleleaf viburnum	CON	Random	2 - 3 ft.	11
		100	**240**	**= total**					
N/A	50			**NATIVE SEED**					
		15	4.1	Andropogon virginicus	Broomsedge	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	5.5	Dichanthelium clandestinum	Deertongue grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		20	5.5	Elymus canadensis	Canada wild rye	LB of P.L.S. 76 %	SEED	N/A	N/A
		15	4.1	Lolium multiflorum	Annual rye grass	LB of P.L.S. 76 %	SEED	N/A	N/A
		13	3.6	Panicum virgatum	Switchgrass	LB of P.L.S. 76 %	SEED	N/A	N/A
		2	0.6	Penstemon digitalis	Beardtongue	LB of P.L.S. 76 %	SEED	N/A	N/A
		10	2.8	Rudbeckia hirta	Black-eyed Susan	LB of P.L.S. 76 %	SEED	N/A	N/A
		5	1.4	Tridens flavus	Purpletop	LB of P.L.S. 76 %	SEED	N/A	N/A
		100	**27.6**	**= total**					

LEGEND

CON= container

P.L.S.= Pure Live Seed

PLANT AND COMPOSITION SCHEDULE				RIPARIAN ZONE-PLANT					
2-Planting Zone 6 - RIPARIAN WOODLAND SUPPLEMENT								**Size (acres):**	**1.69**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
20	109			**TREES**					
		20	37	Celtis occidentalis	Hackberry	CON	Random	3 - 4 ft.	45
		30	55	Fraxinus pennsylvanica	Green ash	CON	Random	3 - 4 ft.	37
		30	55	Quercus palustris	Pin oak	CON	Random	4 - 5 ft.	37
		20	37	Tilia americana	Basswood	CON	Random	3 - 4 ft.	45
		100	**184**	**= total**					
20	109			**MIDSTORY TREES**					
		50	92	Amelanchier arborea	Downy serviceberry	CON	Random	2 - 3 ft.	28
		50	92	Carpinus caroliniana	American hornbeam	CON	Random	3 - 4 ft.	28
		100	**184**	**= total**					
14	222			**SHRUBS**					
		30	113	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	26
		20	75	Lindera benzoin	Common spicebush	CON	Random	2 - 3 ft.	31
		20	75	Sambucus canadensis	American elder	CON	Random	2 - 3 ft.	31
		30	113	Viburnum recognitum	Northern arrowwood	CON	Random	3 - 4 ft.	26
		100	**376**	**= total**					
LEGEND									
CON=container									

PLANT AND COMPOSITION SCHEDULE				RIPARIAN ZONE-PLANT					
2 (OPTIONAL)-Planting Zone 6 - RIPARIAN WOODLAND SUPPLE								**Size (acres):**	**1.69**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
20	109			**TREES**					
		20	37	Celtis occidentalis	Hackberry	CON	Random	3 - 4 ft.	45
		30	55	Fraxinus pennsylvanica	Green ash	CON	Random	3 - 4 ft.	37
		30	55	Quercus palustris	Pin oak	CON	Random	4 - 5 ft.	37
		20	37	Tilia americana	Basswood	CON	Random	3 - 4 ft.	45
		100	**184**	**= total**					
20	109			**MIDSTORY TREES**					
		50	92	Amelanchier arborea	Downy serviceberry	CON	Random	2 - 3 ft.	28
		50	92	Carpinus caroliniana	American hornbeam	CON	Random	3 - 4 ft.	28
		100	**184**	**= total**					
14	222			**SHRUBS**					
		30	113	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	26
		20	75	Lindera benzoin	Common spicebush	CON	Random	2 - 3 ft.	31
		20	75	Sambucus canadensis	American elder	CON	Random	2 - 3 ft.	31
		30	113	Viburnum recognitum	Northern arrowwood	CON	Random	3 - 4 ft.	26
		100	**376**	**= total**					
LEGEND									
CON=container									

PLANT AND COMPOSITION SCHEDULE				RIPARIAN ZONE-PLANT					
1B-Planting Zone 6 - RIPARIAN WOODLAND SUPPLEMENT								**Size (acres):**	**0.13**
Overall Spacing (feet off center)	**Quantity per acre**	**Frequency (%)**	**Species Quantity**	**Vegetation Strata/ Species Name**	**Common Name**	**Unit**	**Spacing Type**	**Size**	**Individual Spacing (ft.)**
20	109			**TREES**					
		20	3	Celtis occidentalis	Hackberry	CON	Random	3 - 4 ft.	157
		30	4	Fraxinus pennsylvanica	Green ash	CON	Random	3 - 4 ft.	136
		30	4	Quercus palustris	Pin oak	CON	Random	4 - 5 ft.	136
		20	3	Tilia americana	Basswood	CON	Random	3 - 4 ft.	157
		100	**14**	**= total**					
20	109			**MIDSTORY TREES**					
		50	7	Amelanchier arborea	Downy serviceberry	CON	Random	2 - 3 ft.	103
		50	7	Carpinus caroliniana	American hornbeam	CON	Random	3 - 4 ft.	103
		100	**14**	**= total**					
14	222			**SHRUBS**					
		30	9	Cornus amomum	Silky dogwood	CON	Random	2 - 3 ft.	90
		20	6	Lindera benzoin	Common spicebush	CON	Random	2 - 3 ft.	111
		20	6	Sambucus canadensis	American elder	CON	Random	2 - 3 ft.	111
		30	9	Viburnum recognitum	Northern arrowwood	CON	Random	3 - 4 ft.	90
		100	**30**	**= total**					
LEGEND									
CON=container									

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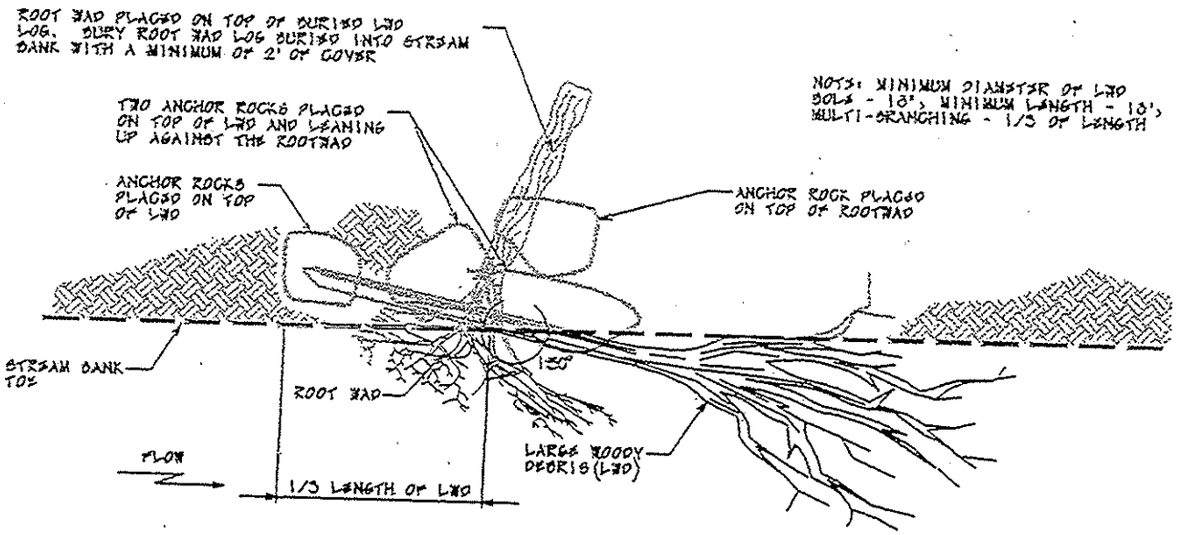
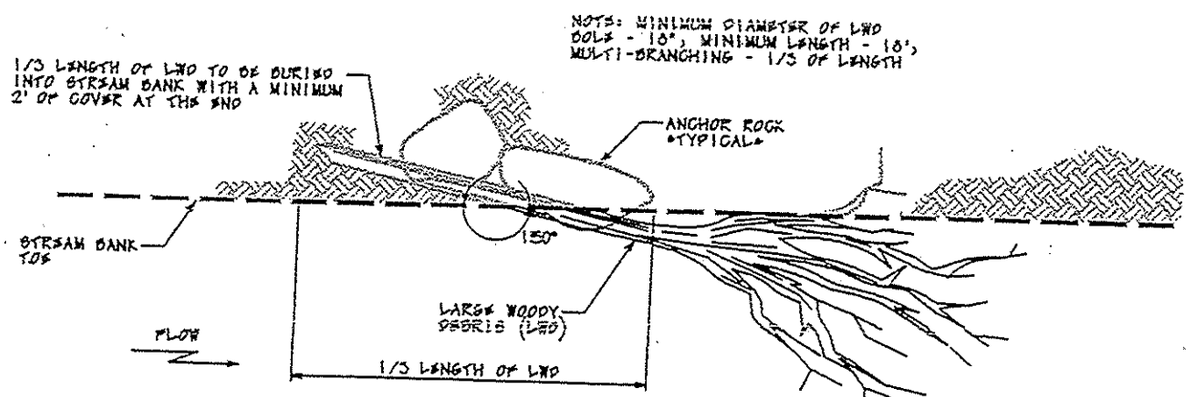


ROOTWAD/LARGE WOODY DEBRIS (LWD) DROP
PLAN VIEW

NOT TO SCALE



LARGE WOODY DEBRIS (LWD) DROP
PLAN VIEW

NOT TO SCALE

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Attachment 15
Future Ball Field Site for the City of Pittsburgh

GENERAL FUTURE BALL FIELD GUIDELINES

1. Coordinate construction of field with adjacent construction efforts.
2. The future ball field shall be oriented in an east-northeast direction from home plate to second base.
3. Bulk field dimensions shall be sized to minimum Colt League standards: 290 to 300 feet at each foul line and 350 feet at center field. Provide 15-foot minimum level foul area adjacent to each foul line.
4. Pitcher's mound shall be the high point. Provide 1.0 minimum to 2.5 percent maximum positive drainage, equally in all directions, within field and foul area limits. First, second, and third base, home plate, and base paths shall be the same elevation. Direct field drainage towards low points and vegetated swales.
5. Cut and fill embankment slopes outside of field and foul area limits shall slope at 3:1 maximum. Slopes greater than 3:1 are not permitted. Slope adjacent to right field foul line shall slope at 6:1.
6. Provide 2.0 percent minimum slope at centerline of swales for positive drainage from newly constructed entrance road culvert to existing wetland adjacent to Nine Mile Run.
7. Provide underdrain system within limits of field area only. Submit shop drawings, including plans, details, and specifications, for approval by the Contracting Officer prior to installation of underdrain system. Discharge underdrain system into vegetated swale unless otherwise directed by the Contracting Officer.
8. Refer to the site plan, attached at the end of this document, that illustrates the general design intent of these guidelines. The site plan is shown for informational purposes only and shall not be used for construction efforts. Submit shop drawings, including plans, details, and specifications, for approval by the Contracting Officer prior to commencing construction operations.

SITE PREPARATION

9. Obtain all necessary permits, relevant drawings, details, and specifications prior to commencing construction operations. This work includes modification of the existing Phase 1A Erosion and Sediment Control Permit (Attachment 8)
10. Contractor shall verify existing field conditions, and review drawings and proposed improvements prior to beginning work. Immediately notify the Contracting Officer of any discrepancies prior to commencing construction operations.
11. Notify PA One Call System, Inc. (1-800-242-1776) prior to beginning work. Immediately notify The Contracting Officer of any conflicts prior to commencing construction operations.
12. Use existing construction entrance for access to Project site.
13. Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project site.
14. Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than final inspection. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
15. Provide erosion-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties.
16. Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during construction operations.
17. Protect existing site improvements to remain from damage during construction. Restore damaged improvements to their original condition, as acceptable to the Contracting Officer.

18. Do not interrupt existing utilities serving facilities occupied by the Government or others unless permitted in writing and then only after arranging to provide temporary utility services according to requirements indicated.
19. Commercial Avenue pavement, shoulder, and guide rail to remain in place.

SITE CLEARING

20. Except for materials to be stockpiled or to remain the Government's property, cleared materials shall become Contractor's property and shall be removed from the site.
21. Erect and maintain a temporary fence around drip line of individual trees or around perimeter drip line of groups of trees to remain. Protect tree root systems from damage, flooding, and erosion. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by the Contracting Officer. Remove fence when construction is complete.
22. Remove obstructions, trees, shrubs, grass, and other vegetation to permit installation of new construction. Removal includes digging out stumps and obstructions and grubbing roots. Remove materials within designated Limit of Work only, unless required to adequately construct proposed site improvements.
23. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated. Place fill material in horizontal layers not exceeding 8-inch loose depth, and compact each layer to a density equal to adjacent original ground.
24. If encountered, remove sod and grass before stripping topsoil. Strip topsoil to whatever depths are encountered in a manner to prevent intermingling with underlying subsoil or other waste materials. Stockpile topsoil materials away from edge of excavations without intermixing with subsoil. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust.
25. Remove existing above- and below-grade improvements as indicated and as necessary to facilitate new construction.
26. Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials, including trash and debris, and legally dispose of them offsite.

EARTHWORK

27. Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
28. Satisfactory soils shall be free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter. Verify satisfactory soils with the Contracting Officer prior to earthwork operations.
29. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.
30. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
31. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
32. Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.
33. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.
34. Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.
35. Place and compact fill material in layers to required elevations.
36. Uniformly moisten or aerate subgrade and each subsequent fill or backfill layer before compaction to within 2 percent of optimum moisture content. Remove and replace, or scarify and air dry, otherwise

satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

37. Place backfill and fill materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
38. Under lawn or unpaved areas, scarify and recompact top 6 inches below subgrade.
39. Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved subgrades to tolerances of plus or minus 1 inch and pavements and areas within building lines to plus or minus 1/2 inch.
40. Engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports. Testing agency shall test and inspect subgrades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; recompact and retest until specified compaction is obtained.
41. Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.
42. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.
43. Where settling occurs before acceptance of construction, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
44. Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it offsite unless otherwise directed by The Contracting Officer.

TOPSOIL INSTALLATION

45. Topsoil shall have a pH range of 5.5 to 7, an average of 5 percent organic material content; and be free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Adjust pH as required with agricultural limestone to bring within tolerances. Import topsoil or manufactured topsoil from off-site sources as approved by the Contracting Officer.
46. Selective herbicides shall be EPA registered and approved, of type recommended by manufacturer for application.
47. Planting Soil Mix: Mix topsoil thoroughly and evenly by machine with professional fertilizer, as recommended in soil reports from a qualified soil-testing agency.
48. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
49. Limit lawn subgrade preparation only to areas to be planted.
50. Loosen subgrade to a minimum depth of 3 inches. Remove stones larger than ½ inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off The Government's property.
51. Spread planting soil mix to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet. Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 3 inches of subgrade. Spread remainder of planting soil mix.

FINISH GRADING

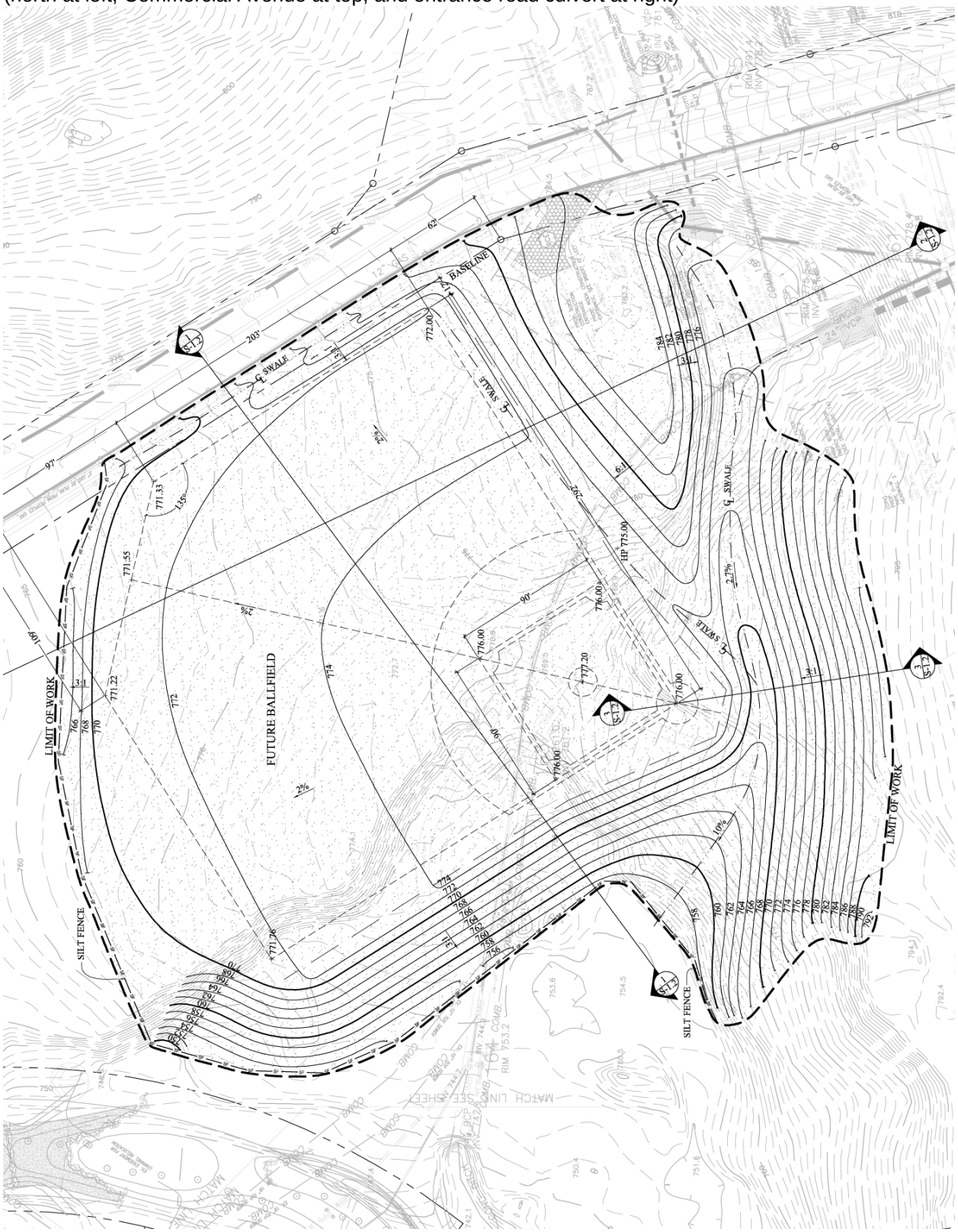
52. Limit fine grading operations to areas that can be planted in the immediate future.
53. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades. Fill all dips and remove bumps in the overall plane of the slope. The tolerance for dips and bumps is ½ inch deviation from the plane in 10 feet. Provide positive drainage from all areas towards existing inlets and drainage structures.
54. Protect soil from compaction after placement. Any area that becomes compacted shall be tilled to a depth of 6 inches and regraded.

55. Moisten prepared lawn areas after installation but prior to seeding. Water thoroughly and let soil stand for 3 days to accommodate settling. Do not create muddy soil. Reset grades as necessary after the soil has settled. Allow surface to dry before planting.
56. Restore areas if eroded or otherwise disturbed after finish grading and before planting.

LAWN SEEDING

57. Seeding is recommended in the Spring between April 15 and June 15 or in the Fall between August 15 and September 30. Proceed with planting only when existing and forecasted weather conditions permit.
58. Seed of grass species shall be composed of the following varieties, mixed to the specified proportions by weight using an approved method and tested to minimum percentages of purity and germination: Kentucky Bluegrass (50 lbs. per acre; 90% min. purity; 80% min. germination), Pennlawn Red Fescue (30 lbs. per acre; 98% min. purity; 85% min. germination), Pennfine Perennial Ryegrass (20 lbs. per acre; 98% min. purity; 90% min. germination), Streaker Redtop (Agrostis Alba; 3 lbs. per acre). Kentucky bluegrass must consist of at least three certified varieties of Kentucky bluegrass with no one variety to exceed 40 percent of the mix. Perennial ryegrass must consist of at least two certified varieties of perennial ryegrass with no one variety to exceed 40 percent of the mix.
59. Seed prepared areas within contract limits and adjoining areas disturbed as a result of the construction operation.
60. Sow seed with a rotary or drop-type distributor at the rate of 10 lbs./1000 sq. ft. If planting in the fall after September 30, use of a slit seeder is required. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other. Do not use wet seed or seed that is moldy or otherwise damaged.
61. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.
62. Protect seeded areas by spreading straw mulch, air-dry, clean, mildew- and seed-free, threshed straw of wheat or oats, within 24 hours after seeding. Spread uniformly at a minimum rate of 2-½ tons/acre, or 2 50-lb. bales/1000 sq. ft., to form a continuous blanket over seeded areas. Spread by hand, blower, or other suitable equipment. Anchor straw mulch by crimping into topsoil with suitable mechanical equipment.
63. Satisfactory Seeded Lawn: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds, undesirable grass species, disease, insects, and surface irregularities. No individual lawn area shall have bare spots or unacceptable cover totaling more than 2 percent of the individual area in areas requested to be inspected. Reestablish lawns that do not comply with requirements and continue maintenance until lawns are satisfactory.
64. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period and remove after lawn is established.
65. Remove erosion-control measures after grass establishment period.
66. Warrant lawn seeding, for a period of 1 year from date of acceptance, against defects including, but not limited to, death, unsatisfactory growth and damage due to Contractor's negligence. Inspection to determine acceptance of lawns will be made by the Contracting Officer upon the Contractor's request.
67. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than 60 days from date of acceptance. Maintain and establish lawn by watering, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn, free of weeds, undesirable species, disease, and insects, that is acceptable to the Contracting Officer.
68. Provide and maintain temporary lawn-watering equipment to convey water from sources and to maintain adequate surface soil moisture for proper seed germination. Continue watering for not less than 30 days. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Water lawn at a minimum rate of 1-½ inches at least 3 times per week. Do not let the surface dry out. After the 30-day period, apply at a rate of ½ inch 2 times per week until acceptance.
69. Mow lawn as soon as top growth reaches 3 inches in height. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain 2 inches in height.
70. The Contractor's responsibility for lawn maintenance will cease upon final acceptance.

GENERAL SITE PLAN – not to scale
(north at left, Commercial Avenue at top, and entrance road culvert at right)



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REPORT OF SURVEY
NINE MILE RUN
PITTSBURGH, PA

INTRODUCTION

Terrasurv was requested to perform a geodetic control survey covering a portion of the Nine Mile Run watershed in Pittsburgh, Allegheny County, Pennsylvania. The purpose of the survey was to provide control values (photo identities) for use in photogrammetric mapping of an area around Nine Mile Run between the Monongahela River to the south and Forbes Avenue to the North.

In addition, three pairs of intervisible monuments were to be established for use in future survey work in the project area. This phase of the project was observed and adjusted separately from the photo control.

The work was performed as a subcontractor to GRW, Inc (client) who was contracted by the Pittsburgh District of the US Army Corps of Engineers (contracting agency).

CONTROL

The contracting agency requested that the horizontal component of the control be referenced to the North American Datum of 1983, 1986 adjustment (NAD 1983 1986), and that the vertical component of the control be referenced to the National Geodetic Vertical Datum of 1929 (NGVD 1929).

The horizontal control consisted of two National Spatial Reference System (NSRS) stations located along the Monongahela River. Station **7002** (PID# KX2402) is a City of Pittsburgh City Line disk in a monument box at the now abandoned Amoco Refinery, on the left bank of the Monongahela River at river mile 5.75, just west of the mouth of Streets Run and the Glenwood Bridge. Station **L/D 2 M 6** (PID# KX2396) is a USCE survey disk on the right bank land wall at Lock and Dam 2, at the lower lock gates. Both of these stations were part of the USCE Monongahela River GPS network done in 1989. They are first order horizontal and second order class I vertical control.

The vertical control consisted of the two stations used for horizontal control, and station **IVY** (PID# KX1251). This is a USCE harbor line monument located along the rail line on the right bank of the river, approximately 165 m upstream of the upstream edge of the railroad bridge over Nine Mile Run, in the Duck Hollow section of Pittsburgh. This station has a vertical accuracy of first order class I.

In 1988, a second order level run was made starting at **3041** (PID# KX1478) and **3042** (PID# KX1479), both of which are first order class II benchmarks. This level line, run with a Wild NA-2 with micrometer and invar rods, ran along the perimeter of this project, and ended at **IVY**. The line closed +0.000 m, and was computed on the NGVD 1929

datum. Several elevations determined in the 1988 run were used in the current project. Ties were made at the following stations: 00028I, 00028K, 00028N, and 00028U.

In addition to the requested datums, horizontal positions were also computed on the North American Datum of 1927 (NAD 1927), utilizing the USCE river control, and on the North American Datum of 1986, 1996 adjustment (NAD 1983 1996), utilizing the Continuously Operating Reference Station (CORS) PIT1. The elevations were computed on the North American Vertical Datum of 1988 (NAVD 1988) as well.

PHOTO CONTROL STATIONS

The locations of the photo identities were selected by GRW. The following is a list of the photo control points:

name	GPSID	description
101	00028A	C/L sidewalk @ west end of street
102	00028B	NW corner of walk at end
103	00028C	NW edge of street @ c/l narrow sidewalk
104	00028D	NW corner of drive @ S edge of street
105H1	00028E ECC	base of pole
105H2	00028E ECC	Post
105H3	00028E ECC	Milepost
105V1	00028E ECC	C/L tracks opposite signal box
105V2	00028E ECC	C/L tracks opposite milepost
106	00028F	SW corner of drive
107	00028G	SW corner of drive @ N edge of road
108H	00028H ECC	base of pole
109	00028I	NW corner of pavement
110H	00028J ECC	base of lone tree
110V1	00028J ECC	C/L road opposite tree
110V2	00028J ECC	C/L road X C/L trail
111	00028K	center of CB grate on N side of street
112	00028L	NW corner of pavement
113H	00028M ECC	Base of northernmost goal post
114	00028N	edge of pavement at end of stop bar
115	00028O	C/L sidewalk X C/L sidewalk
116	00028P	NW corner of sidewalk intersection
117	00028Q	C/L manhole
118	00028R	N edge of sidewalk @ C/L sidewalk
119	00028S	NW corner of sidewalk @ N edge of drive
120	00028T	NE corner of parking pavement
121	00028U	C/L manhole
122	00028V	center of CB grate on N side of street

Note that additional identities were selected at several of the stations (105 & 110). At 105, the pole selected was located on a steep bank, and therefore additional horizontal

and vertical identities were surveyed along the railroad tracks. At 110, additional vertical identities (coordinated) were surveyed.

The short eccentrics at 108 and 113 were done with a compass (corrected for declination) and tape. The longer offsets at 110 and 105 were done using a Zeiss S10 total station, utilizing distant intersection stations for orientation.

MONUMENTS

Three monument pairs were established in locations which would be useful for conventional surveying. The following is a description of these stations:

00028AA: located at the fishing area at the bottom of Old Browns Hill Road, in the Duck Hollow Section of the City of Pittsburgh, on the right bank of the Monongahela River. It is a disk on a concrete structure, 15.25 m SW of a triangular metal structure near the SE corner of the parking area, 0.67 m landward of the river wall. Intervisible with 00028AB. "DUCK HOLLOW"

00028AB: located on an access bridge to an old water intake station at the former USX Homestead Works in Homestead, in what is now a new development, behind the Eat N Park headquarters building (under construction), on the left bank of the Monongahela River. The disk is 15.81 m N of the NE corner of the building, 0.805 m north (riverward) of the south end of the access bridge, and 0.545 m E of the E face of the W curb of the bridge. Intervisible with 00028AA. "EAT N PARK"

00028AC: To reach, take Beechwood Boulevard east from Browns Hill Road to the entrance to Rosemont (new subdivision). Travel to the end of the cul-de-sac, and walk out to the edge of the hill, past the air monitor station. The station is a disk in a concrete monument in the cleared area around the edge of the hill, 10.464 m from three punch marks in a fence corner post at the air monitor station, and 0.5 m back from the edge. Intervisible with 00028AD. "ROSEMONT"

00028AD: located in a clearing off of Commercial Street, now reachable only from Whipple Street in Swissvale due to a road closure. There is a boarded up construction trailer to the SE, and the station is near the guardrail. The station is a disk in a concrete monument, 7.085 from a PK in a utility pole, and 10.472 m from a punch mark in the top of a guardrail post. Intervisible with 00028AC. "COMMERCIAL"

00028AE: located on a traffic island between Forbes Avenue and Beechwood Boulevard, near the entrance to Homewood Cemetery. The station is an existing disk cemented in the concrete island, stamped 226 AZIMUTH MON VALLEY EXP. Intervisible with 00028AF. "BEECHWOOD"

00028AF: located on the back wall of a catch basin on the north side of Forbes Avenue, near a small gas utility building. The disk is 0.52 m east of the east edge

of the building extended, 5.57 m from the corner, 0.119 m north of the south face of curb on the north side of Forbes, also 2.88 m south of the south face of a stone wall. Intervisible with 00028AE. “FORBES”

Four of the six stations have additional backsight objects. A steel standpipe (WTVENT) located atop a hill near the Monongahela Cemetery, straddling the Braddock and Braddock Hills boundary was intersected from EAT N PARK, DUCK HOLLOW, and ROSEMONT. The point sighted was the small vent rising from the center of the roof of the tank. A barrel like object (HAZELMICRO) atop a radio tower just west of Calvary Cemetery in the Glenwood section of the City of Pittsburgh was intersected from ROSEMONT and DUCK HOLLOW. Both of these intersection stations were previously coordinated during a electronic traverse along the Monongahela River for sounding control. Station BEECHWOOD is an existing azimuth mark set in 1988 during mapping of the proposed Monongahela Valley Expressway. The main station MV226 was tied by angle and distance measurements. All of these additional measurements were included in the adjustment, as were the EDM and zenith distances between the stations of each monument pair.

Sketches of these stations are included in appendix A.

GPS OBSERVATIONS

The project was observed in two phases. The photo control was done on days 099 and 101 of 2000. The following is a summary of the station occupations:

Day 099 (three receivers):

Station	Filename	UTC Start	UTC End	Duration
00028C	97570990.DAT	12:38:00	13:00:45	23 min
00028B	17690990.DAT	12:44:00	13:00:30	17 min
00028A	99810990.DAT	12:51:00	13:22:15	31 min
00028G	97570991.DAT	13:12:15	13:59:15	47 min
00028D	17690990.DAT	13:13:00	13:22:00	9 min
00028H	17690990.DAT	13:41:00	14:00:00	19 min
00028I	99810991.DAT	13:42:00	14:53:30	72 min
00028V	17690990.DAT	14:19:30	15:30:00	71 min
00028J	97570992.DAT	14:24:30	14:45:15	21 min
00028K	97570993.DAT	15:10:30	15:30:15	20 min
00028R	99810992.DAT	15:13:15	16:08:00	55 min
00028Q	97570994.DAT	15:39:45	16:07:30	28 min
00028S	17690990.DAT	15:47:30	16:46:15	59 min
00028T	97570995.DAT	16:16:45	16:46:15	30 min
00028U	99810993.DAT	16:29:45	17:15:00	45 min
00028O	17690991.DAT	16:58:15	17:14:15	16 min
00028O	17690992.DAT	18:17:30	18:47:00	30 min
00028N	9757099B.DAT	18:20:00	18:47:00	27 min
00028F	99810994.DAT	18:27:00	18:47:15	20 min
00028T	9757099C.DAT	18:55:45	19:32:15	37 min
00028P	17690992.DAT	19:05:00	19:32:15	27 min
00028M	99810995.DAT	19:16:00	20:30:15	74 min
00028H	17690992.DAT	19:41:15	20:30:00	49 min
00028L	9757099D.DAT	19:55:15	20:30:30	35 min
00028F	99810996.DAT	20:51:15	21:28:30	37 min
00028C	17690992.DAT	20:55:15	21:46:00	51 min
00028E	9757099E.DAT	21:11:00	21:28:15	17 min
KX1251	9957099F.DAT	21:36:45	21:46:00	9 min

Day 101 (two receivers):

Station	Filename	UTC Start	UTC End	Duration

00028N	97571010.DAT	11:47:00	12:14:30	28 min
KX2396	99811011.DAT	13:43:45	18:30:15	287 min
KX1251	97571011.DAT	14:08:30	14:26:45	18 min
KX2402	97571012.DAT	18:06:45	19:34:30	88 min
00028R	99811010.DAT	18:54:00	19:08:15	14 min

The monument control was done on day 228 using two receivers:

Station	Filename	UTC Start	UTC End	Duration
KX1251	99812280.DAT	17:00:00	17:37:30	38 min
00028AA	97572280.DAT	17:00:30	18:31:30	91 min
00028AB	99812281.DAT	17:48:30	18:05:00	17 min
00028AC	99812282.DAT	18:16:30	18:31:00	15 min
00028AD	99812283.DAT	18:50:00	19:52:15	62 min
00028AC	97572281.DAT	18:51:30	19:20:00	29 min
00028AB	97572282.DAT	19:36:00	19:53:45	18 min
00028AC	97572283.DAT	20:06:15	20:35:00	29 min
00028AE	99812284.DAT	20:08:15	21:29:45	82 min
00028AF	97572284.DAT	20:55:30	22:15:30	80 min
00028AD	99812285.DAT	21:51:00	22:17:15	26 min

No equipment or other problems were encountered during the observations.

GPS DATA PROCESSING

The GPS data was downloaded to a PC and processed using the GPSurvey WAVE processor, version 2.35. The single baseline method was used. Most of the baselines in the network independent (i.e. non trivial), but several of the "trivial" baselines from day 099 were included. These lines are not totally non-trivial, due to differening start and stop times. The broadcast ephemeris was used. The following is a summary of the baseline processing for the photo control network:

FILENAME	FROM	TO	DATE	TIME	DUR	RATIO	VAR	RMS	LENGTH
00063958	00028A	00028B	04/08/00	12:51	10	14.81	4.25	0.006	625 m
00063962	00028A	00028C	04/08/00	12:51	10	12.00	8.68	0.009	788 m
00063966	00028B	00028C	04/08/00	12:44	17	67.14	6.89	0.008	613 m
00064010	00028C	00028E	04/08/00	21:11	17	9.66	17.56	0.016	611 m
00064014	00028C	00028F	04/08/00	20:55	33	13.75	6.57	0.008	914 m
00064006	00028C	KX1251	04/08/00	21:36	9	75.64	2.37	0.005	59 m
00063954	00028D	00028A	04/08/00	13:13	9	10.92	4.34	0.007	867 m
00064018	00028F	00028E	04/08/00	21:11	17	10.08	13.62	0.015	539 m
00063946	00028G	00028A	04/08/00	13:12	10	10.01	4.24	0.006	1319 m
00063950	00028G	00028D	04/08/00	13:13	9	18.94	2.56	0.005	588 m
00063942	00028H	00028G	04/08/00	13:41	18	20.14	16.93	0.017	721 m
00063998	00028H	00028L	04/08/00	19:55	35	3.86	38.11	0.023	975 m
00063886	00028I	00028G	04/08/00	13:42	17	13.30	2.64	0.005	852 m
00063894	00028I	00028H	04/08/00	13:42	18	20.62	18.28	0.017	744 m
00063882	00028I	00028J	04/08/00	14:24	21	22.80	1.96	0.005	610 m
00063890	00028I	00028V	04/08/00	14:19	34	11.85	3.79	0.006	1051 m
00063898	00028J	00028V	04/08/00	14:24	21	10.24	6.23	0.008	819 m
00063910	00028K	00028R	04/08/00	15:13	17	10.86	3.53	0.006	463 m
00063990	00028M	00028H	04/08/00	19:41	49	10.68	23.96	0.018	704 m
00063982	00028M	00028L	04/08/00	19:55	35	3.66	18.00	0.014	562 m
00063994	00028M	00028P	04/08/00	19:16	16	9.06	9.01	0.009	578 m
00063986	00028M	00028T	04/08/00	19:16	16	15.06	2.33	0.006	912 m
00063978	00028N	00028F	04/08/00	18:27	20	12.02	8.98	0.011	555 m
00063970	**00028O**	**00028F**	**04/08/00**	**18:27**	**20**	**1.71**	**71.39**	**0.025**	**1092 m**
00063974	**00028O**	**00028N**	**04/08/00**	**18:20**	**27**	**1.89**	**112.63**	**0.031**	**537 m**
00064046	00028O	00028N	04/10/00	11:49	26	12.28	7.56	0.009	537 m
00064002	00028P	00028T	04/08/00	19:05	27	4.49	6.83	0.009	454 m
00063922	00028Q	00028S	04/08/00	15:47	20	5.08	12.44	0.011	589 m
00063914	00028R	00028Q	04/08/00	15:39	28	11.11	6.65	0.009	893 m
00063918	00028R	00028S	04/08/00	15:47	21	5.84	9.99	0.011	1087 m
00063930	00028S	00028T	04/08/00	16:16	30	4.05	9.48	0.010	460 m
00063926	00028S	00028U	04/08/00	16:29	17	3.41	11.93	0.012	1096 m
00063934	00028T	00028U	04/08/00	16:29	17	11.03	3.22	0.006	671 m
00063938	00028U	00028O	04/08/00	16:58	16	12.41	5.29	0.008	593 m

00063906	00028V	00028K	04/08/00	15:10	20	8.45	6.59	0.009	708 m
00063902	00028V	00028R	04/08/00	15:13	17	11.21	5.10	0.007	1159 m
00064038	KX2396	KX1251	04/10/00	14:08	18	9.14	1.79	0.014	5247 m
00064034	KX2396	KX2402	04/10/00	18:06	24	14.36	1.19	0.011	6692 m
00064042	KX2402	00028R	04/10/00	18:54	14	11.33	2.15	0.016	6177 m

The two baselines denoted above in **bold** type were rejected.

The data from the CORS station PIT1 was obtained and processed using the data from day 099. The following summarizes these results:

00063870	**pit1**	**00028A**	**04/08/00**	**12:51**	**31**	**8.97**	**5.17**	**0.027**	**24515 m**
00063846	**pit1**	**00028C**	**04/08/00**	**20:55**	**51**	**25.94**	**1.56**	**0.015**	**23730 m**
00063830	pit1	00028F	04/08/00	20:51	37	13.56	2.48	0.016	22824 m
00063866	**pit1**	**00028G**	**04/08/00**	**13:12**	**47**	**4.97**	**5.15**	**0.024**	**23316 m**
00063850	pit1	00028H	04/08/00	19:41	49	6.99	4.86	0.025	22598 m
00063862	pit1	00028I	04/08/00	13:42	72	4.72	1.19	0.012	22788 m
00063834	**pit1**	**00028L**	**04/08/00**	**19:55**	**35**	*******	**21.97**	**0.049**	**21633 m**
00063838	pit1	00028M	04/08/00	19:16	74	7.70	3.44	0.021	21971 m
00063858	pit1	00028R	04/08/00	15:13	55	29.63	0.99	0.010	20781 m
00063874	pit1	00028S	04/08/00	15:47	59	1.74	8.12	0.031	20915 m
00063842	pit1	00028T	04/08/00	18:55	37	27.28	0.95	0.010	21302 m
00063854	pit1	00028U	04/08/00	16:29	45	10.26	2.13	0.017	21633 m
00063878	pit1	00028V	04/08/00	14:19	71	7.79	2.00	0.016	21795 m

Of the thirteen baselines processed from PIT1, four were rejected. The other nine were included in the adjustment.

The monument network was observed on day 228. The following is a summary of these results:

FILENAME	FROM	TO	DATE	TIME	DUR	RATIO	VAR	RMS	LENGTH
00087929	00028AA	00028AC	08/15/00	18:16	15	14.96	5.14	0.007	929 m
00087945	00028AE	00028AC	08/15/00	20:08	27	7.09	11.19	0.012	1721 m
00087925	00028AA	00028AB	08/15/00	17:48	17	17.34	16.50	0.013	356 m
00087941	00028AF	00028AD	08/15/00	21:51	25	6.90	11.71	0.012	1506 m
00087921	00028AA	KX1251	08/15/00	17:00	37	15.39	5.83	0.007	265 m
00087957	00028AD	00028AB	08/15/00	19:36	16	13.38	3.20	0.007	1459 m
00087937	00028AE	00028AF	08/15/00	20:55	34	3.18	18.07	0.016	379 m
00087953	00028AD	00028AC	08/15/00	18:51	29	21.29	1.91	0.005	728 m
00087933	pit1	00028AE	08/15/00	20:08	82	6.62	2.57	0.017	22116 m
00087949	pit1	00028AD	08/15/00	18:50	62	13.09	1.86	0.015	22533 m
00087917	pit1	00028AA	08/15/00	17:00	91	12.65	2.63	0.019	23976 m

All of these results were acceptable.

LEAST SQUARES ADJUSTMENTS

Geolab was used to perform all of the various adjustments. No scaling of the apriori baseline statistics was done. Geoid heights were interpolated for each station using the GEOID99 model. Station errors (HI and centering) of 0.005 m were input for the GPS observations.

The first adjustment was a free adjustment of the GPS only portion of the photo control network (i.e. no traverse or eccentric observations). A map of this network is shown in figure 1. Station **7002** was held fixed in all three dimensions (NAD 1983 1986 latitude and longitude, NGVD 1929 orthometric height). The estimated variance factor was 1.18. The plot in figure 2 shows the horizontal and vertical residuals versus baseline length for this adjustment. The misclosures at the other control stations were as follows:

Station Name	Azimuth	Distance	Δ Height
00028I			+0.009 m
00028K			+0.036 m
00028N			+0.019 m

00028U			+0.002 m
KX1251			+0.001 m
KX2396	319ø	0.037 m	+0.011 m

As can be seen, the misclosures are all within the expected range. The output from this adjustment is included in appendix B.

The next adjustment added the traverse and eccentric information to the network, vertically constrained the four new stations with elevations, and constrained in all three dimensions the two existing NSRS stations, **7002** and **L/D 2 M 6**. This adjustment had an estimated variance factor of 1.70. The output from this adjustment is included in appendix C. The coordinates from this adjustment were provided to the client to be used as photo control for aerotriangulation.

The monument network was surveyed as a network with a tie to **IVY** and **PIT1**. The coordinate for **IVY** resulting from the photo control network was constrained in a free adjustment. The network is shown in figure 3. This adjustment had an estimated variance factor of 1.31. A level tie from BEECHWOOD to a nearby TBM from the 1988 survey had a vertical misclosure of 0.008 m. A subsequent adjustment was performed which constrained **IVY** in all three dimensions, and BEECHWOOD (00028AE) vertically. This adjustment had an estimated variance factor of 1.27. This adjustment supplied the coordinates for the monuments, and the output is included in appendix D. The plot in figure 4 shows the horizontal and vertical residuals versus baseline length for this adjustment.

Although not requested by the contracting agency, adjustments were also performed on the NAD 1983 1992 horizontal datum and NAVD 1988 vertical datum, as well as the NAD 1927 horizontal datum.

A free adjustment was run holding the NAD 1983 1996 coordinates of PIT1 fixed, as well as the GPS derived NAVD 1988 orthometric height of PIT1. This adjustment included all of the GPS observations from both the photo control network and the monument network, as well as the traverse observations and eccentric measurements. The estimated variance factor was 1.14. The misclosure at the other control stations were as follows:

Station	Azimuth	Distance	Δ Height
KX1251			+0.018 m
KX2396	51ø	0.102 m	+0.021 m
KX2402	51ø	0.108 m	+0.007 m

The vertical misclosures are excellent. The horizontal misclosures show a bias of approximately 10 cm. This is common in Pennsylvania, and results from the poor ties between the HARN/CORS network and the existing NSRS network. Although the two Monongahela River GPS Network stations were established using GPS, they were controlled by triangulation stations. The ties between the existing triangulation network and the HARN/CORS are very sparse. Because of this, these two stations were not constrained horizontally in the subsequent constrained adjustment.

A constrained NAD 1983 1992/NAVD 1988 adjustment was done which held PIT1 fixed in all three dimensions, and KX1251, KX2396, and KX2402 fixed vertically. The coordinates from this adjustment are listed below.

A final adjustment held the two Monongahela River GPS network stations fixed horizontally on NAD 1927. The horizontal coordinates from this adjustment are also given below.

SUMMARY

A geodetic control network was established in Allegheny County, Pennsylvania for the purpose of photogrammetric mapping of a portion of the Nine Mile Run watershed. The relative accuracy of the network is first order (10 ppm). The absolute accuracy of the network on NAD 1983 1992/NAVD 1988 is ±0.03 m, and ±0.05 m on NAD 1983 1986/NGVD 1929.

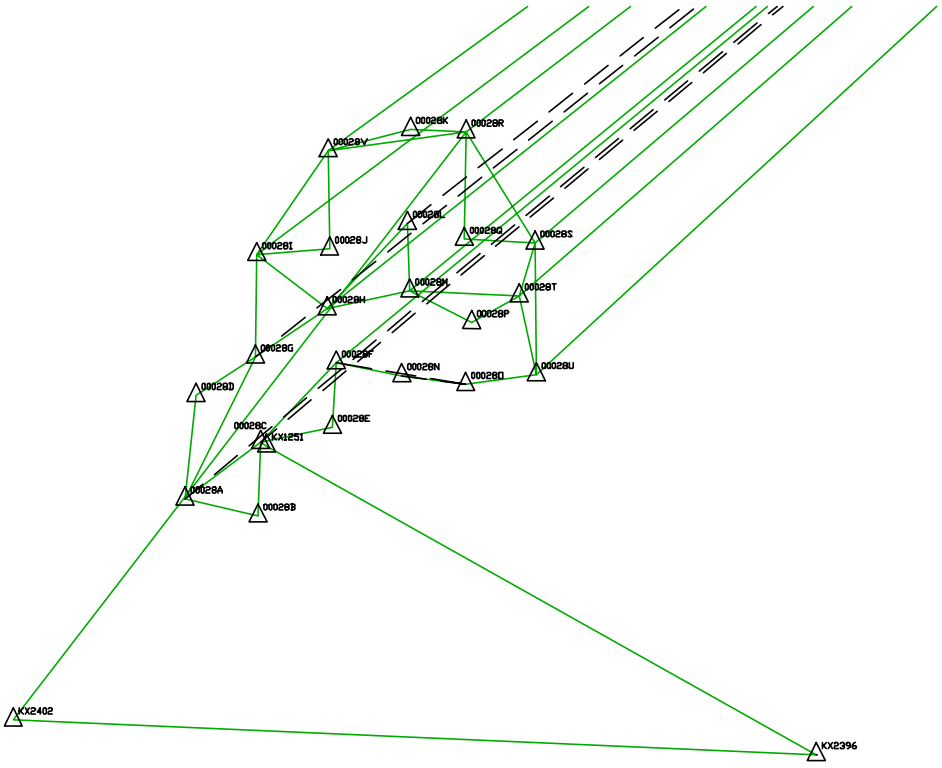

Figure 1 - Photo Control network

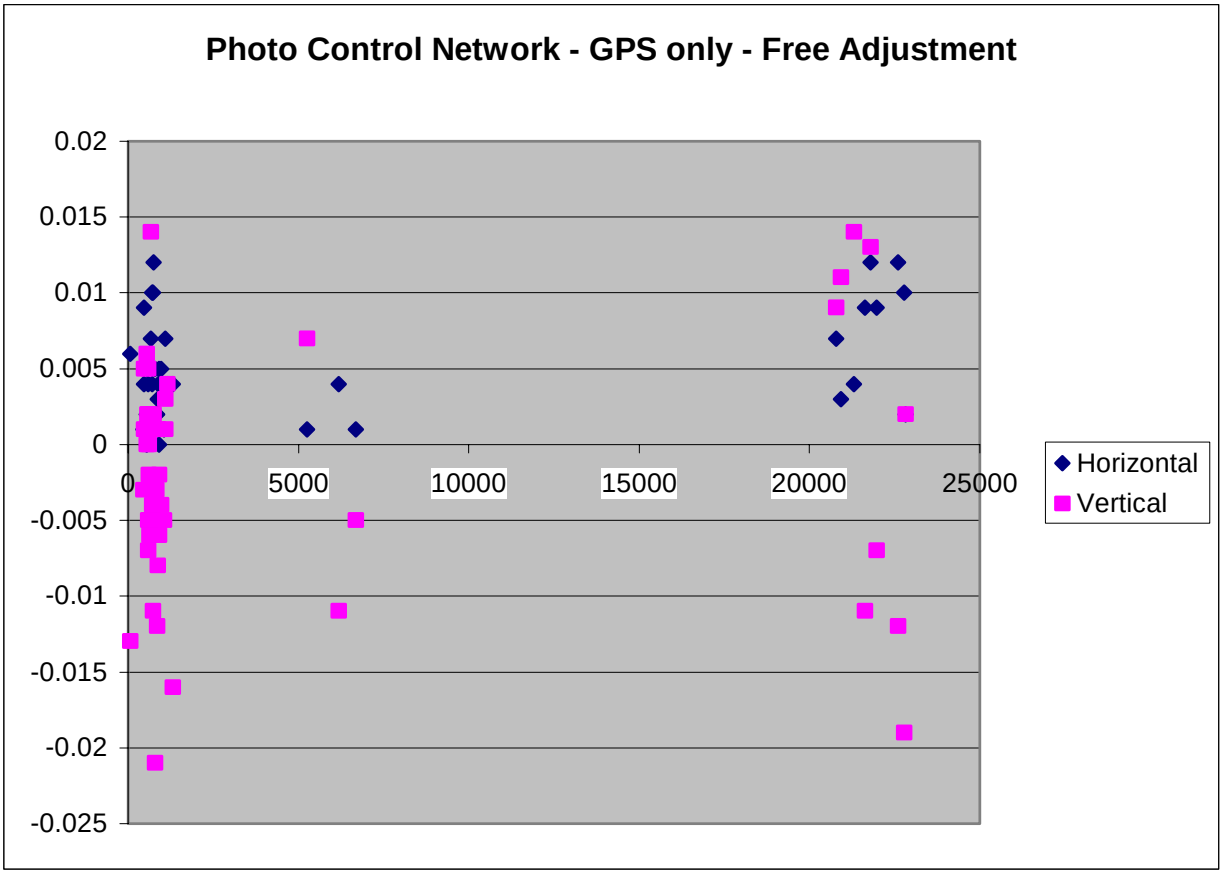

Figure 2 - Free Adjustment Residuals Photo Control Network

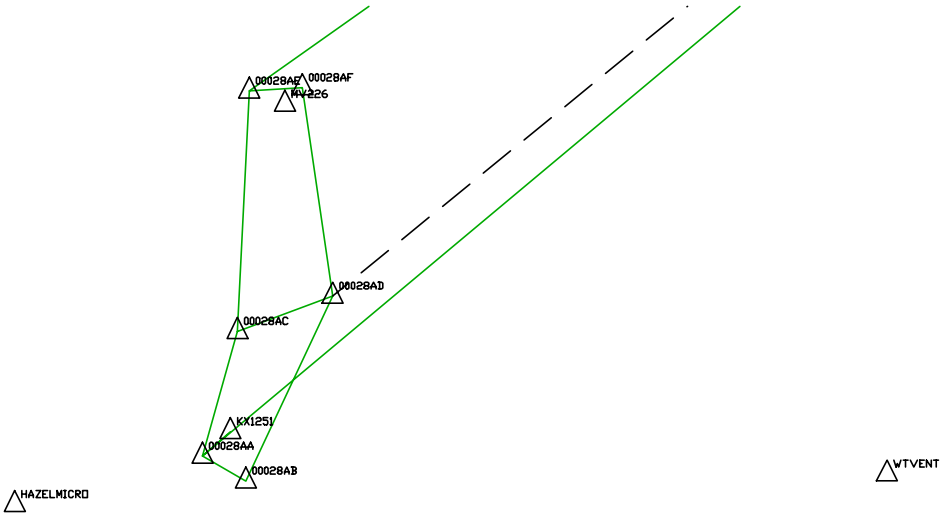

Figure 3 - Monument network

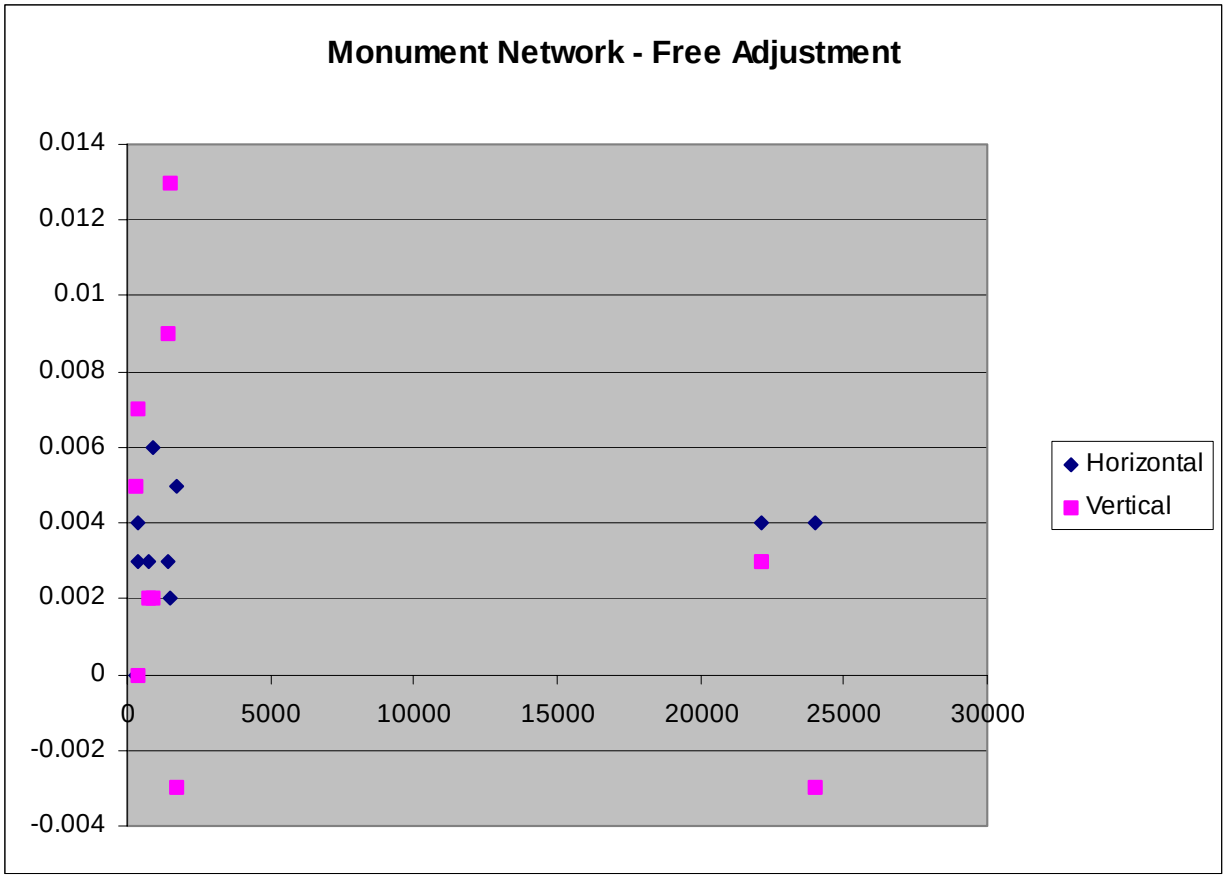

Figure 4 - Free Adjustment Residuals Monument Network

Geographic Coordinates – NAD 1983 1986/NGVD 1929 meters

Station name	DD.MMSSssss	DD.MMSSssss	NGVD 29
00028A	+40.244373915	-79.551903928	279.471
00028B	+40.243892060	-79.545337681	226.404
00028C	+40.245877823	-79.545212383	226.078
00028D	+40.251161627	-79.551470183	314.363
00028E	+40.250258950	-79.542669843	229.274
00028F	+40.251994846	-79.542509201	272.652
00028G	+40.252182038	-79.545361428	313.808
00028H	+40.253459240	-79.542806129	266.139
00028I	+40.254941105	-79.545272706	345.491
00028J	+40.255069893	-79.542692187	335.031
00028K	+40.262266917	-79.535783977	287.435
00028L	+40.255732751	-79.535935253	244.717
00028M	+40.253912794	-79.535880664	234.322
00028N	+40.251625186	-79.540203241	276.056
00028O	+40.251371439	-79.533948213	269.077
00028P	+40.253038314	-79.533713726	260.288
00028Q	+40.255286358	-79.533933278	274.932
00028R	+40.262180888	-79.533823209	277.638
00028S	+40.255164744	-79.531439207	278.031
00028T	+40.253742651	-79.532020712	265.289
00028U	+40.251612166	-79.531451814	284.970
00028V	+40.261721597	-79.542700963	305.088
105H1	+40.250285773	-79.542675087	231.017
105H2	+40.250294316	-79.542491782	228.181
105H3	+40.250231666	-79.542982566	228.664
105V1	+40.250283909	-79.542478089	229.083
105V2	+40.250217640	-79.542979675	229.565
108H	+40.253460079	-79.542807586	266.139
110H	+40.255111069	-79.542734712	335.930
110V1	+40.255089174	-79.542728131	335.547
110V2	+40.255091557	-79.542710634	335.478
113H	+40.253911904	-79.535881363	234.322
KX1251	+40.245775546	-79.545001015	228.411
KX2396	+40.233266491	-79.513732815	223.342
KX2402	+40.234468037	-79.562064720	222.229
PIT1	+40.330373303	-79.415003350	387.967
WM TANK	+40.220215201	-79.552106762	
00028AA	+40.245218145	-79.545853741	222.236
00028AB	+40.244629080	-79.544553760	227.315
00028AC	+40.252095183	-79.544753173	307.386
00028AD	+40.252889612	-79.541862393	236.118
00028AE	+40.261662630	-79.544304435	319.725
00028AF	+40.261723257	-79.542698290	305.243
HAZELMICRO	+40.244148128	-79.555545080	
MV226	+40.261346816	-79.543230087	329.615
TBM	+40.252128376	-79.544885781	307.083
WTVENT	+40.244605636	-79.513177261	

PA South Zone State Plane Coordinates – NAD 1983 1986 US Survey FT.

Station name	Northing	Easting
00028A	400435.8779	1363757.9807
00028B	399899.6831	1365730.4180
00028C	401906.1722	1365876.5568
00028D	403247.7692	1364162.7121
00028E	402243.6187	1367851.9233
00028F	403996.6802	1368019.0322
00028G	404240.0212	1365818.4710
00028H	405483.7251	1367825.6717
00028I	407029.5104	1365955.4943
00028J	407110.9705	1367953.5743
00028K	410290.3802	1370280.5208
00028L	407729.5595	1370101.1665
00028M	405887.3896	1370098.5408
00028N	403579.2282	1369792.7885
00028O	403280.1225	1371530.0718
00028P	404961.9994	1371752.3144
00028Q	407240.3361	1371637.8055
00028R	410166.5011	1371793.9987
00028S	407070.5582	1373562.8761
00028T	405642.7933	1373078.4837
00028U	403476.8521	1373466.1279
00028V	409793.7040	1368012.3367
105H1	402270.8526	1367848.5345
105H2	402276.0323	1367990.4748
105H3	402221.9265	1367609.4503
105V1	402265.2456	1368000.8108
105V2	402207.6827	1367611.3381
108H	405484.6017	1367824.5637
110	407153.4294	1367921.7141
110V1	407131.1552	1367926.2594
110V2	407133.2352	1367939.8470
113H	405886.5022	1370097.9778
KX1251	401798.6993	1366037.4568
KX2396	392829.9184	1380730.4457
KX2402	394578.9939	1358845.9242
PIT1	449561.1714	1427433.1207
WM TANK	384093.1350	1363198.9126
00028AA	401250.9819	1365364.2711
00028AB	400630.4221	1366354.8731
00028AC	404140.6297	1366286.5849
00028AD	404889.6479	1368541.2109
00028AE	409764.3684	1366771.4392
00028AF	409795.3329	1368014.4416
HAZELMICRO	400276.8881	1360936.7527
MV226	409424.5584	1367594.0708
TBM	404176.7208	1366184.8803
WTVENT	400244.2779	1381337.4967

Geographic Coordinates – NAD 1983 1992/NAVD 1988 meters

Station name	DD.MMSSssss	DD.MMSSssss	NAVD 88	Ellip H
00028A	+40.244373923	-79.551902931	279.315	245.654
00028AA	+40.245218164	-79.545852750	222.103	188.444
00028AB	+40.244629097	-79.544552771	227.185	193.532
00028AC	+40.252095199	-79.544752183	307.258	273.593
00028AD	+40.252889624	-79.541861400	235.994	202.335
00028AE	+40.261662646	-79.544303440	319.598	285.919
00028AF	+40.261723272	-79.542697296	305.118	271.444
00028B	+40.243892070	-79.545336685	226.250	192.598
00028C	+40.245877835	-79.545211390	225.925	192.266
00028D	+40.251161633	-79.551469183	314.206	280.536
00028E	+40.250258960	-79.542668847	229.121	195.468
00028F	+40.251994853	-79.542508202	272.499	238.841
00028G	+40.252182043	-79.545360426	313.649	279.982
00028H	+40.253459242	-79.542805124	265.979	232.316
00028I	+40.254941106	-79.545271700	345.330	311.656
00028J	+40.255069893	-79.542691179	334.873	301.206
00028K	+40.262266913	-79.535782970	287.299	253.633
00028L	+40.255732752	-79.535934247	244.556	210.895
00028M	+40.253912795	-79.535879658	234.160	200.504
00028N	+40.251625191	-79.540202241	275.910	242.260
00028O	+40.251371440	-79.533947208	268.920	235.278
00028P	+40.253038315	-79.533712719	260.126	226.479
00028Q	+40.255286352	-79.533932265	274.775	241.122
00028R	+40.262180880	-79.533822193	277.483	243.823
00028S	+40.255164742	-79.531438197	277.870	244.226
00028T	+40.253742652	-79.532019705	265.127	231.484
00028U	+40.251612168	-79.531450811	284.802	251.168
00028V	+40.261721595	-79.542699953	304.933	271.258
105H1	+40.250285783	-79.542674089	230.864	197.211
105H2	+40.250294319	-79.542490783	228.028	194.375
105H3	+40.250231689	-79.542981571	228.511	194.857
105V1	+40.250283911	-79.542477091	228.930	195.278
105V2	+40.250217662	-79.542978681	229.412	195.758
108H	+40.253460081	-79.542806581	265.979	232.316
110	+40.255111070	-79.542733702	335.772	302.105
110V1	+40.255089174	-79.542727122	335.388	301.721
110V2	+40.255091557	-79.542709625	335.319	301.652
113H	+40.253911906	-79.535880357	234.160	200.504
HAZELMICRO	+40.244148158	-79.555544088		
KX1251	+40.245775573	-79.545000039	228.262	194.604
KX2396	+40.233266541	-79.513731866	223.196	189.625
KX2402	+40.234468007	-79.562063673	222.065	188.411
MV226	+40.261346832	-79.543229093	329.488	295.813
PIT1	+40.330373303	-79.415002340	387.807	354.289
TBM	+40.252128392	-79.544884790	306.955	273.290
WM TANK	+40.220215201	-79.552106762		
WTVENT	+40.244605614	-79.513176210		

PA South Zone State Plane Coordinates – NAD 1983 1992 US Survey FT.

Station name	Northing	Easting
00028A	400435.8671	1363758.7464
00028AA	401250.9826	1365365.0372
00028AB	400630.4205	1366355.6389
00028AC	404140.6270	1366287.3509
00028AD	404889.6413	1368541.9767
00028AE	409764.3658	1366772.2050
00028AF	409795.3293	1368015.2149
00028B	399899.6742	1365731.1916
00028C	401906.1656	1365877.3226
00028D	403247.7565	1364163.4854
00028E	402243.6098	1367852.6966
00028F	403996.6683	1368019.8055
00028G	404240.0074	1365819.2443
00028H	405483.7083	1367826.4446
00028I	407029.4927	1365956.2673
00028J	407110.9515	1367954.3552
00028K	410290.3575	1370281.2937
00028L	407729.5415	1370101.9473
00028M	405887.3716	1370099.3217
00028N	403579.2145	1369793.5618
00028O	403280.1045	1371530.8526
00028P	404961.9814	1371753.0953
00028Q	407240.3111	1371638.5860
00028R	410166.4742	1371794.7792
00028S	407070.5372	1373563.6566
00028T	405642.7753	1373079.2645
00028U	403476.8357	1373466.9012
00028V	409793.6830	1368013.1175
105H1	402270.8440	1367849.3081
105H2	402276.0166	1367991.2481
105H3	402221.9311	1367610.2164
105V1	402265.2289	1368001.5762
105V2	402207.6864	1367612.1042
108H	405484.5847	1367825.3367
110	407153.4114	1367922.4950
110V1	407131.1362	1367927.0402
110V2	407133.2162	1367940.6278
113H	405886.4854	1370098.7587
HAZELMICRO	400276.8992	1360937.5267
KX1251	401798.7082	1366038.2153
KX2396	392829.9515	1380731.1816
KX2402	394578.9434	1358846.7356
MV226	409424.5558	1367594.8365
PIT1	449561.1540	1427433.8999
TBM	404176.7185	1366185.6464
WM TANK	384093.1350	1363198.9126
WTVENT	400244.2362	1381338.3080